

June 4, 1962



B 6/8

NOTES 6-4-62 GORMAN

1. DIXON'S VISIT - Please note from the attached telephone resume that Tom Dixon plans to be here the latter part of June to discuss the possibility of getting Boeing and Chrysler located at Michoud. Although Tom was a little vague I got the impression that the subject had been discussed with Seamans and others. It is my recommendation that we move to firm up a plan with Boeing as soon as possible even if it has to be changed later. Our next job is to convince Washington that such a plan is essential.

Dr. Lange RUSH

for info & action (closed envelope)
B

gone Dr. Lange
6/9/62 (Saturday)
B

Telephone conversation between Mr. Gorman and Mr. Dixon, June 1, 1962

Mr. Dixon: We have had some discussions here on the housing situation, and I wanted to give you some food for thought. When would it be possible to get as many as possible of the Boeing and Chrysler people down to Michoud from a housing point of view? I would like for you and Neubert to think about this, and talk to Eberhard and Wernher as to when it might be done.

Mr. Gorman: There are a couple of things under way that you might not be aware of: We are, at the present time, working with Boeing to establish firm plans for Boeing here and at Michoud, and we have also asked Chrysler to solicit private industry down there to build a building for them on private property close by the plant with the idea that they will house the administrative and engineering people in this building, and this will free up space in the Michoud plant for Boeing. We should have a pretty good picture of what this means in two weeks or so.

Mr. Dixon: I think as soon as this honeymooning is over, we should get them on their own. This is something I wanted all of you to know. We are going to have to look at your ^{f/oor}space situation down there. I am going to come down this month.

Mr. Gorman: I think it would be well if you could arrange your visit here when we could have the planning worked out with Boeing. We hope by June 18 to have this picture pretty well in hand. I would recommend that Wernher give you the pitch.

Mr. Dixon: I may bring Ralph Ulmer with me. We may not have a solution for it, but at least we know you have a problem.

Mr. Gorman: The idea of having several people located several places in down town Huntsville is not good.

Mr. Dixon: I will be away from the office for a week. Will come to Huntsville soon and discuss the situation.

Dr. Lange
for info (closed envelope)
B 6/8
gave Dr. Lange
Sat 6/8/62

B6-4

1. RENOVATIONS AT MICHLOUDa. General:

Initial renovations to the office and engineering buildings are completed. It was reported that sprinkler system is completely rusted and should be replaced.

b. Cooling Tower:

Repairs to Cooling Tower (Manufacturing Building) are approximately 95% complete. ✓

c. Contractor:

It is estimated that renovation contract with Gurtler-Hebert will be completed by June 8, 1962. ✓

* 2. SLIDELL FACILITY

Jan The GSA issued a "use agreement" to Marshall for the former FAA Air Route Traffic Control Center in Slidell, Louisiana. The "use agreement" permits MSFC to occupy, use, and modify the facility in accordance with their requirements. The formal transfer of the facility will be effected in about three months. ✓

3. UNION ACTIVITY

The United Plant Guard Workers of America have organized the Mason-Rust guard employees. Negotiations between the union and the Mason-Rust Company will begin within the next two weeks. ✓

4. MICHLOUD PERSONNEL

Recruiting for the following positions has been accomplished:

<u>Name</u>	<u>Position Title</u>	<u>Reporting Date</u>
James Funkhouser	Public Information	On-board
John Maraglia	Labor Relations	June 18, 1962
Frank Henrie	Support Services	On-board

✓

NOTES 6-4-62 DEBUS

B
6-8

1. Reference your questions on Apollo Saturn Launch Operations Panel

(1) The "wet test vehicle" is the SA-DV dynamic test vehicle. It will also be used as a launch complex, compatibility-test-vehicle at the Cape. ✓

(2) The 15 March Launch Operations Panel meeting was held under the charter of 3 October which is presently being revised. This will be divided into sub-panels to establish more direct lines of communication and reduce number of personnel. ✓

2. Evans: (Reference your question in last week's notes) Burttschell's choice is for W. Evans in his PMR office and not "Mr. Centaur" Evans (F.E.) in Hueter's office. ✓

3. Reliability Evaluation: I have agreed to have the ARINC Research Company evaluate our needs for a reliability program. They spent six weeks here with SA-2 while it was on the pad. Their report is due in June. It is the consensus that a similar survey should be made of SA-3. The SA-2 work was one of several phases of a contract initiated by NASA Headquarters, technically supervised by the MSFC Saturn Office at a cost of about \$45,000. The MSFC Saturn Office agrees to extend the present contract for SA-3 at the Cape and let us take technical supervision. This may require additional funding. LOD will exercise technical supervision in evaluation of SA-3. ✓

4. Centaur: Salvage operations have been continued to date for recovery of F-1 parts. GD/A engineers were here last week to inspect the debris and it is expected that further recovery efforts will be terminated shortly. ✓

5. Proposed MSFC/LOC Separation Agreement: Target date for submission of proposed MSFC/LOC Separation Agreement remains week of June 4 (probably latter part). Final draft is being prepared by MSFC. ✓

6. Fire Detection - SA-3: Measuring Group, LOD, has designed and developed a new ground instrumentation system for the fire detection (on-board) system. New features increase response, accuracy, and reliability. The system will be employed in SA-3 and subsequent launches. Complete documentation is in progress for a technical report to be issued soon. Will forward a copy of the report or prepare a briefing for you if you desire. ✓

B
6/8

1. SATURN SA-5 FLUTTER PROBLEM: Our contract consultants at Lockheed have proposed a wind tunnel program to obtain unsteady air loads for SA-5. Wind Tunnel time has been obtained at Ames Center for August. Model will be constructed by Lockheed. ✓

As the Air Force is rapidly withdrawing from the Agena in-flight load measuring program, the anticipated full scale buffet data will not be forthcoming. As a result, it will be very difficult to completely analyze the Centaur failure and to extrapolate SA-5 wind tunnel data to full scale. It is thus very desirable to obtain such aerodynamic load data on SA-3 or SA-4. ✓

2. LOR TRACKING: Feasibility investigations of tracking and related aspects of the lunar orbital rendezvous (LOR) mode of manned lunar landing are being completed. ✓

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B 6-8

1. SYSTEMS CHECKOUT AND PREFLIGHT TESTING WORKING GROUP: Per your request for further comments (copy of NOTES 5-14-62 GRAU attached), representatives of Electrical Systems Integration Branch, Astrionics Division, M-ASTR-E, have been present in all discussions with DAC on the S-IVB. Astrionics Division and Quality Assurance Division have submitted questions and comments to DAC on the Automation Plan. A working agreement exists with Mr. Fichtner that discussions on checkout GSE for S-II and S-IVB will be handled by the Checkout Working Group, in which Astrionics Division has representation. ✓

There has been no co-ordination with GE through the Checkout Working Group, unless done by Mr. Fichtner, since no apparent need has existed for such co-ordination. GE personnel have had discussions with Performance Test Branch and apparently concluded the preliminary study (in the checkout area) which is to determine what is to be included in the six month study. ✓

2. PRATT & WHITNEY RL-10 ENGINE: Per your request for further comments (copy of NOTES 5-14-62 GRAU attached), our receiving inspection and testing showed that engine S/N 1728 was in general good condition. Discrepancies included several minor leaks, insufficient clearance between lines and inadequate clamping of lines. Documentation received was somewhat incomplete, however corrective measures have been taken. ✓

3. NASA HEADQUARTERS PERSONNEL ORIENTATION: Mr. James Koppenhaver, Director of Reliability and Quality Assurance and his deputy, Mr. Howard Weiss were guests of Quality Assurance Division on May 28 and 29. General orientation with MSFC and the Quality Assurance Division was the purpose of the visit. ✓

* 4. SA-5 CONTAINERS LING-TEMCO-VOUGHT: Fine deposits of copper have been noted in seven containers processed at Ling-Temco-Vought. Copper residue was traced to the deionized water system which includes approximately 1600 feet of copper tubing or lines. Responsible MSFC personnel prescribed an ammonia hydroxide flush to correct the situation on affected tanks. To date the 105" and 70" - 1A containers have been reprocessed and accepted. Prior to the initiation of flush operations, the deionized water system was cleaned up and verified by the contractor that the copper content was within specified limits. ✓

5. SATURN INSTRUMENT UNIT MOTION SIMULATOR: Final design documentation has been received from the contractor and is undergoing evaluation prior to the start of the hardware phase. The SIUMS fixture will allow this Division to check the complete Instrument Unit under conditions of pitch, yaw, and roll, which in turn will more closely approximate flight environments with flight configurations. ✓

D.F. Hope it is usable or modifiable to 260" later! B 5
6. RADIO FREQUENCY INTERFERENCE MEASUREMENTS: Detail noise measurements have been conducted at the Michoud Facility at the request of the Chrysler Corporation, and at the Pearl River Test Site in compliance with a request from the Test Division. Ambient noise level measurements were also made in the bay area of building 4708. These measurements are necessary for future evaluation of RFI which may emanate from the space vehicle, its related GSE or facility type support equipment. ✓

7. F-1 and J-2 ENGINES: Representatives of the Mechanical Systems Analysis Branch attended a four day orientation and familiarization discussion on quality control and checkout at Rocketdyne. Sessions of the J-2 Program Review Meeting were also attended. ✓

B6-P

NOTES - HAEUSSERMANN, 6/4/62

* Jm 1. NEGOTIATIONS OF ST-124 REORDER; 5/28: MSFC Negotiation Team consisted of a procurement representative, cost analyser, legal adviser, and technical representative (~~Weber of ASTR~~). In several cases it was necessary to go into considerable detail to determine the accuracy and philosophy of the estimates (~~examples given below~~). All members of the Negotiation Team agreed that the revised estimates of efforts and costs were realistic and correct. It should be realized that the scope of work had been reviewed and adjusted during an earlier session at MSFC with many items of the "nice-to-have" category eliminated. After discussing several items in much detail, it was realized that at best we could reduce the estimate 1 to 2 per cent. It was, eventually, agreed that the last figure would be reduced by about 2.5 per cent and the privilege to apply reductions to least affected areas given to E-P.

a. Cost Figures:

E-P original estimate:	13,742,805.
With reduced scope:	10,450,225.
With corrections of administrative costs:	10,360,000.
Final agreement with 2.5% cut, about:	10,100,000. ✓

b. Ratio of Inspection to Productive Effort:

Presently for Pershing - 2.8:1 (One inspector to every 2.8 production people). Saturn is estimated as 3.5:1. This relatively high ratio for Saturn is justified by E-P because inspectors will require more time in parts inspection since no special gages and instruments are available. Less inspection time will be required later. (Pershing is, in the opinion of E-P engineers, over-inspected.) ✓

2. TDY FUNDS: We have been advised from Central Planning Office in their meeting of program coordinators on 5/31 that there is no indication of additional funds being made available in this category and we must operate within the balance of funds indicated by memo from Gorman, 6/1. As of 6/4 we have a balance of 11.6K to carry us through the remainder of this month. With our heavy commitments on Saturn, plus initiation of the Centaur Evaluation, it will be impossible to meet all necessary TDY requirements with the indicated balance. Either additional funds must some how be provided, or schedules must be adjusted accordingly.

Harry Jorman B

NOTES 6/4/62, Helmburg

B6-8

1. SA-T4:

SA-T4 was installed in the Static Test Tower. The first firing is planned for around 6/15/62. ✓

2. H-1 ENGINE LOX BEARING PROBLEM:

Rocketdyne personnel will be at MSFC this week to demonstrate their electronic "listening" device and analysis technique in determining turbopump bearing conditions. ✓

*jam
3. FACILITIES:

The Mobile District Office received bids on modification of the West Side of the existing Static Test Tower last week. Authorization to make awards of contract was furnished Mobile District by Facilities Engineering Office. Greenhut Construction Company of Pensacola was low bidder. This Contractor performed very poorly on the construction of the Dynamic Test Stand. ✓

B6-P

NOTES 6-4-62 HOELZER

- * 1. CENTRAL COMPUTER FACILITY AT MICHOUDE: The decision has been made to use the Slidell facility to house the computers and data reduction equipment which will be centralized for common use of the stage contractors and other groups at Michoud. Plans are being given to the architect engineer for modifications to the facility to accept the first phase of computer equipment by October 1, 1962. The digital computers have been selected and are scheduled for delivery by October 1. The scientific complex is essentially IBM and the commercial (ADPS) complex is Honeywell. The total monthly rental will be in the neighborhood of \$125,000 a month. These actions were presented to Mr. Rees, Mr. Constan and representatives of other interested offices and divisions on Friday, June 1. At this meeting it was determined that a separate contract for operation of the central computer facility would be let to a company specializing in this field. ✓
- 9cm

36/8

NOTES 6-4-62 Koelle

FPO has no NOTES this week.

B6-8

1. SA-T: The SA-T booster was returned from ME Division to Test Division on May 31. Plans are to instrument this stage in accordance with SA-4 configuration prior to additional static testing. ✓
2. SA-3: The booster for SA-3 vehicle was transferred from Test Division to ME Division on May 31 for post static rework and assembly. ✓
3. SA-4: Transfer of the SA-4 booster from ME Division to Quality Division for pre-static checkout was accomplished on May 28. ✓
4. Miscellaneous: Mr. Willis Groth, Chairman of the Assembly Working Group, has been requested by Brookhaven National Laboratory, Associated Universities, Inc., N.Y., to serve as an engineering consultant relative to the fabrication of a Nuclear Reactor Pressure Vessel. Services are to be provided on a reimbursable basis. They include review of design manufacturing specifications, manufacturing procedures, shop practices, material, personnel and equipment certifications, as well as examination of in-process details of components, sub-assemblies, and the assembled pressure vessel for conformance to contractual requirements. Fabrication of the pressure vessel will be performed at Shreveport, La. Since the work will be performed on a non-interference basis, I support Mr. Groth's request, which is presently being processed through channels. I feel such activities by our personnel reflect favorably both on the individual and MSFC. ✓

WK
→ so do I.
I believe this needs HQ approval.
Please check w/ Sullivan
B
5. S-1C: In reply to your question regarding transportation of 33' Y-ring; Boeing found four boring mills big enough for the job which are located in waterways. However, the latest plan presently being discussed is to install a 65' dia. boring mill at Michoud for this job. We are in favor of this plan if Boeing can give us assurance that, (1) the installation will be in time to cover our needs, and (2) the utilization factor will be sufficient to justify the purchase. ✓

Attachment 1, NOTES 5-28-62 KUERS

90m

1. C-1

SA-3: Booster transfer to M-QUAL for post static checkout is forecast for 6-19-62. Shipment date to AMR (8-24-62) and launch date remain on schedule. ✓

SA-4: Booster transfer to M-TEST is forecast for 8-13-62. Final resolution on secondary missions of hydrogen venting tests and/or a section of S-IV interstage should be made by 6-11-62. ✓

SA-5: Start of booster assembly is forecast for 6-25-62. Revised M-ME assembly process should permit transfer of stage to M-QUAL on schedule. ✓

S-IV: The honeycomb has been successfully bonded to the aft dome of the all systems common bulkhead with bonding of the forward dome now in process. ✓

Battleship - Resolution on incorporation of safety features in the stage was completed at meeting between DAC, M-TEST and M-SAT in Sacramento on 6-1-62. Cold flow tests are scheduled for week of 6-11-62 and hot firing tests for week of 6-18-62. ✓✓✓

Systems Integration Area- Systems tests are scheduled for the full scale mockup and GSE beginning 6-4-62. ✓

Chrysler Contract: A pre-negotiation conference is scheduled for 6-21/22-62 followed by final negotiations starting 6-25-62. Final contract will be signed prior to expiration of Phase I contract (7-31-62). ✓

2. C-5

S-IC: First full duration F-1 engine test was conducted successfully by Rocketdyne on 5-26-62, indicating 70,000 lbs. excess thrust. ✓

Stage descriptions of the various S-IC Ground Test Stages are being revised. Preliminary analysis of testing requirements indicates little or no justification for the reliability test stage. *Heimburg attr. - giv* ✓

Resolution on the Michoud High Bay Area configuration has been obtained. The A&E contractor is now performing cost analysis. ✓

A meeting between contractors and MSFC is scheduled for 6-6/7-62 to solve common facility problems. ✓

Air conditioning of Michoud Adm. Bldg. was completed and is operating. ✓

Due to changes in Boeing/MSFC responsibility assignments, the 6-10-62 date for completion of the Program Development Plan is slipping. ✓

A working group under P&VE leadership was established to establish a procedure for referencing Boeing material and process specifications to MSFC drawing systems. ✓

On 6-1-62 MSFC/Boeing agreements were reached relative to proper course of action to minimize the potential contract overrun as presented by Boeing letter 5-29-62. ✓

3. APOLLO

MSC has been requesting C-5 minimum guaranteed escape payload since 2 months. It is necessary that Weight and Performance Board signs off for a figure now. (85,000 lb?)

→ We gave them officially
O.L. — 90,000 for sub-orbital staging
 — 82,500 for orbital staging
 (both figures allowing a 3000 lbs reserve for the "slice". Exact definition available from Thomas/AEAO) — B

Dr. von Braun's Comments to Notes 5-21-62, Mrazek

C-1: Reliability test program for S-1 is being delayed because M-SAT has returned hardware request to M-ME and has failed to release funds for modification of LOX and fuel tank testing tower which has been under contract NA58-1682 since 6-29-61.

- Bob Lindstrom, What's that? -

(M-SAT discussed the proposed reliability structural test with P&VE and it was decided that the testing tower (located in Detroit) would not be considered for modification until after CSD had submitted, and MSFC approved, the total Block II S-I reliability program. - P&VE S-I reliability funds processed to date are \$912,000.)

✓ B 6/8/62

May 22, 1962

Dr. von Braun:

(attached)
Reference: Notes of Mr. Kuers, 5/14/62 regarding modification to Boeing Contract for Fabrication Services in Support of S-IC "in-house program" and your note of 5/18/62 requesting status of this modification.

Current Status: The modification was handcarried to NASA Headquarters on May 12, 1962 for approval since the dollar value (\$1,800,000) was above the local delegation of authority. The modification was presented to the NASA Procurement Committee on May 14, 1962. Daily follow-up has been made by our P&C Office, however, approval has not been received. The contract modification was signed by Mr. Wilbur Davis on May 12, 1962, however, the contract does not become operative until ratified by Mr. Brackett at NASA Headquarters. Task Orders have been prepared and will be released to Boeing by Michoud Operations upon NASA ratification.

Past History: The original request for the Contract Amendment was generated by M-ME on March 16, 1962. We ran into a conflict as to mode of operation and incremental funding of the Modification. This was cleared up on April 25, 1962, when Mr. Gorman issued a memorandum to clarify the mode of contracting with the Boeing Company. A meeting was held on May 7, 1962 with representatives from this Office, M-ME, M-MICH and M-FIN in attendance at which time all points of conflict were resolved. The action was initiated to P&C, and that office in turn expedited the action to NASA Headquarters.

Konrad Dannenberg
Konrad Dannenberg
2370

NOTE:

We received a notice this morning that NASA Headquarters has approved the modification to the Boeing Contract covering the fabrication services required by Mr. Kuers. We have only verbal information over the telephone. Unfortunately, Headquarters put the written approval in the mail instead of forwarding a TWX. You might possibly want to ask Mr. Rosen to follow up by TWX approval.

B6-4

- * 1. RIFT: Negotiations with Lockheed on the RIFT contract will begin at MSFC on 6-7-62. Contract coverage is hoped for prior to 7-1-62, and will extend through 4-30-63. Hardware commitment decision will be made at that time based on reactor success. ✓
2. PROPELLANT TANKS FOR SA-5: Using the techniques recommended by personnel from M-P&VE-M, the 105" tank for SA-5 was flushed at Chance-Vought for a total of 32 hours to remove the copper contamination found on the inside surfaces. Upon completion of the flushing operation, spot checks developed at MSFC indicated almost complete removal of the copper. The remaining propellant tanks are presently being flushed using the procedures finally adopted for cleaning this first tank. As a result of an analysis of the processing procedures used on these tanks and supplemented by chemical spot checks of a container which was partially processed, it was concluded that this problem resulted from copper contamination of the distillate water used for final calibration of the tank. A memorandum has been prepared for distribution to other MSFC contractors, advising them of this problem and requesting that their processes be reviewed to determine if a similar danger exists at their facility. ✓
3. M-P&VE-P analysis of the S-II LOX pressurization system shows NAA underestimated LOX tank pressurant by approximately 2000 lbs. The fuel pressurization system is now being investigated. M-P&VE-P will actively participate in solution of problems confronting NAA in pressurization system design. ✓
4. BOOKING PERSONNEL: Personnel on board as of 5-31-62: 255; a loss of 40 (temporary) personnel since last week. ✓
5. S-IVD: At the request of the Research Projects Office, an investigation is being made for the installation of a micrometeorite sensor test patch. The patch is to be 12 inches wide by 12 inches long. It will consist of a layer of aluminum or stainless steel, a layer of mylar and a second layer of aluminum. This sandwich will be bonded with some non-conducting material and attached to the S-IVD skin with a resin bond. ✓

See Attachment for Abbreviations

Destroy, keep to one page. jcm

W.M.

Please keep me posted on resolution of RIFT assembly facility (MOFFET hangar?) and cold flow test program. B

NOTES 6-4-62 Rudolph

36-8

Negative.

900

B6-8

1. SUPPORTING RESEARCH: The total authorized FY-1962 Supporting Research Program is \$10,463, which includes the LVT program and Mr. Koella's FPO program. Due to funding limitations, FMO has made only \$8.0 million available for finalizing contracts. Of this \$8.0 million, \$7.585 has already been obligated on finished contracts, and an additional \$.400 has been assigned to contracts sent out to contractors for signature. P&C has an additional eleven contracts totalling \$.830 million ready for signature but for which funds have not been released by FMO. FMO has been requested to release \$1.0 to permit finalization of these contracts. P&C has enough contract requests on hand to use the entire \$10.463 FY-1962 authorization, but it is not known if FMO will be able to release funds for this entire amount, or if P&C will be able to handle all the actions.

Harry
Gorman
B

2. VISIT BY OART GROUP: Mr. John Sloop and a group of five from the Office of Advanced Research and Technology visited MSFC on June 1 to discuss the OART Program Areas of "Chemical Propulsion" and "Space Power". The group furnished guidelines concerning the level of funding that MSFC could expect in FY-1963 for these two OART program areas. It seems that the available funding will not nearly match our requested budget, but of course this is usually the case. One point of concern to us is that Mr. Sloop's group is beginning to specify suggested funding amounts, and detailed guidelines, for individual contract efforts ("tasks"), which we had proposed in our LVT Program Book. In the past this had been left up to us (within the overall funding available in a specific research category, eg, Applied Physics), and Mr. Dixon had promised this center during his recent visit that this freedom of action on the part of the centers would be maintained. It certainly appears now that we must expect a much greater degree of control from Headquarters in the supporting research area in the future.

A further point of concern to us is the fact that OART takes interest only in those tasks which pertain to advanced technologies, while many of our proposed tasks belong in the area of direct support of existing projects, eg, Saturn or Centaur. These tasks would logically fall under the cognizance of OMSF. However, we have not yet succeeded in establishing an immediate working relationship with OMSF in connection with our LVT supporting research program. OART had indicated earlier that the question of splitting our LVT program between OART and OMSF would be worked out between OART and OMSF directly. Our LVT Program Book was sent to OART and to OMSF March 12, 1962. We will write a letter to OMSF, asking for the initiation of working relations between OMSF and MSFC with respect to our FY-1963 LVT program.

yes

3. SUMMER VACATION: I will leave for my summer vacation on June 9. Mr. Heller and the branch chiefs of EPD will be here during my absence except for occasional TDY.

Include this also without stepping on OMSF's toes too hard
E. S.
for my signature
Suggest you draft a well-worded letter to Dixon, quoting his past promises, and asking him to set Sloop straight

B6-8

1. F-1 ENGINE PROGRAM: The first full duration, full thrust, F-1 engine static firing was achieved 5-26-62. Engine #007 ran 151 seconds at 1570 K thrust. ✓✓✓

* Jan 2. J-2 ENGINE PROGRAM: All testing activities were stopped during this report period on Engine #001 at Test Stand VTS-3B, due to shutdown of the bowl area for installation of the VTS-3A altitude diffuser.

The VTS-1 high pressure LOX run tank and adjacent plumbing was severely damaged by a fire on 5-24-62. An investigation of the damage is currently in progress and repair time required has not been determined. The cause is considered to be contamination in the pressurant GN₂ system and will result in a further delay in testing of engine #001 at Test Stand VTS-3B while the pressurant system is checked for contamination. Estimated down time of facility is 4 to 6 weeks, provided the LOX tank, which is a thick-walled high pressure vessel, is not damaged beyond repair and the repair can be made on site. The tank has been X-rayed and was appraised 6-1-62 by a state safety inspector to determine if it could be repaired. In the event it can be repaired, a local vendor has been contacted to do the work. This will necessitate moving the tank from the test area to the vendor plant. The vendor will be unable to give an estimate of the time required to repair the tank until a thorough inspection is made in his plant. A high pressure LOX tank of the same size in the Bravo area (Atlas test stand) can be moved to the VTS-1 stand in the event the down time during repair is excessive. Since VTS-1 and HTS are the only facilities available to test J-2 engine thrust chamber/injector, the time lost will cause a slippage in the J-2 engine development schedule. ✓

3. M-1 ENGINE PROGRAM: The first M-1 Project Management Meeting will be held on 7-16/17-62 at Sacramento.

The first hot firing of the M-1 Wedge Motor was accomplished on 5-24-62 for a duration of three seconds. Minor tube erosion in the throat area occurred after a section of tubes separated from the aluminum jacket near the exit manifold. The damaged hardware indicated that severe temperature gradients caused contraction of the tubes which resulted in tube separation. ✓

4. H-1 ENGINE PROGRAM: One sample of the integral hood and liners turbine exhaust duct has completed 2200 seconds of testing at the Canoga Facility. Two 1/2" long hairline cracks were found on the downstream edge of the bellows liner after 1500 seconds testing. After 1800 seconds, inspection revealed a 1/8" long crack in the inside radius of the first bellows convolution. However, the duct has not developed a hot gas leak. Testing will continue until a leak occurs.

1085 seconds testing has been completed on the MSFC 188K inboard exhaust duct. No leakage was observed. ✓

5. RL10 ENGINE PROGRAM: Air Force LH₂ Plant # 74 became inoperative on 5-31-62. It is anticipated that repairs will require two weeks. There was a three to four day supply of LH₂ in storage at the time of shutdown. ✓

See Attachment for Abbreviations *Destroy one page only Jan*

*
Let Hg
know
this, too,
so they
hopefully
realize
that the
M-1
schedule
may not
run as
smoothly
as
per jet
claims
B

June 11, 1962.

NOTES 6-11-62 GORMAN

B6-12

1. CENTRAL LAB AND OFFICE BUILDING - A contract has been negotiated with Wyatt C. Hedrich for the design of the FY 63 addition to the Central Lab and Office Building. Cost of the building, which will be entirely separated from the present building, is estimated at \$2.5 million. ✓

2. MISSISSIPPI TEST FACILITY - To date 20 tracts of land totaling 222 acres have been purchased at a cost of \$147,800. Organized opposition by the land owners to prices being offered for land is continuing. A petition signed by 514 residents, protesting the purchase prices of land, was presented to the Hancock County Board of Supervisors. Mr. Joe Senter, Assistant Chief, Appraisal Division, Office Chief of Engineers, is in Bay St. Louis this week reviewing appraisals made by the Mobile District to date and is expected to complete his review on June 8, 1962. ✓

3. S-II TEST COMPLEX - At the request of NASA Headquarters, a project request was prepared and forwarded for the construction of two acceptance test stands, control and instrumentation building, service building, etc., for the acceptance testing of S-II stages at MTF. ✓

↓
Dr. Lange Cy of unopened item furnished
 Dr. Lange 6/12 - Jaf.
Have they gone thru M-SAT? Who's behind this?
B6/12

1. RENOVATIONS AT MICHOU

a. Office Building:

Air Conditioning System: Completed, except insulation. Insulation approximately 95% complete. ✓

b. Engineering Building:

Complete except Executive Dining Room and Punch List Checkout. ✓

c. General:

Cooling Tower completed. ✓

2. FOUNDRY EQUIPMENT

The package has been completed for the removal of foundry equipment from the foundry building. The scope will be submitted to GSA for bids within the next 2 weeks. Plan includes restoration of the foundry building to a useable condition. ✓

NOTES 6-11-62 DEBUS

B 6-11

1. Organization: Holmes distributed a document, "Basic Concepts for the Operation of the Launch Operations Center at the Atlantic Missile Range," to MSC, MSFC, and LOC. Comments are to be returned to him by June 15th. Principals to have a meeting on initial charter before July 1. ✓

(Pre-Flight Operations Div)

* 2. Spacecraft-Complex Compatibility: POD has formally requested MSC, Houston, to review Spacecraft access requirements in terms of the mobile concept for VLF-39. According to this request, conflicts or non-conformance will be accompanied by cost and design recycle time penalties. ✓

* 3. Meeting on Complex 39: Conference on Complex 39 has been set for June 12-13. Participation in this LOD meeting has been requested from MSC, members of the MSFC Automation Board, Astrionics Div., and P&VE Div. It is anticipated that the first morning session will be devoted to prepared presentations. The afternoon session will be allocated to discussion and comparison. The second day session will be used to draw conclusions and give necessary guidance so that work can proceed on preparation of the design criteria for Complex 39. ✓

4. LOD-Douglas-Chrysler Relationships: A meeting was held with appropriate representation from the operating offices to discuss in detail LOD relationship with Chrysler and Douglas on the C-1 program. The level of effort contract with Chrysler for FY-63 for launch support was explained to all concerned. The depth of penetration by LOD into the DAC S-IV operation was discussed. A letter has been sent by this office to the DAC AMR Field Station requesting that LOD be furnished, for review and approval, test objectives and all test procedures to be used for the S-IV stage in the Special Assembly Building and on the launch pad. ✓

5. Off-Site Leased Space: 15,000 square feet of office type space will be leased by July 30, 1962. This is in addition to 10,000 square feet on hand. A 50,500 square ft. administration facility will be leased by December 31, 1962, at which time the 25,000 square feet then on hand will be evacuated. K.D. Location? B

6. Visits

a. Diluzio is visiting with me for two days (Monday and Tuesday). ✓

b. Dr. Franz-Josef Strauss, Minister of Defense (Germany) will be guest of the Air Force at AMR. Will attend dinner with Davis. ✓

K.D. Give him my regards. I know him quite well B

*✓ 1. METEOROLOGICAL PROGRAM PRESENTATION AT HEADQUARTERS: On June 2, 1962, the NASA Meteorological Program (Status, Manpower, Costs, & Plans) Presentation was made to Mr. Webb at NASA Headquarters. Dr. Morris Tepper, Office of Applications, was in charge. Presentation centered around Tiros, Nimbus and Aeros (not an approved program) satellite and high altitude rocket sounding programs by Goddard. Main item was that NASA Headquarters Staff considers the atmospheric work at MSFC, LRC and Wallops Station (Operational Support only) not a part of the so-called NASA Meteorological Program but an integral part of the Spacecraft Development Programs. This is perhaps as it should be since the Headquarters Meteorological Program personnel are concerned mainly with Meteorology as an end within itself rather than as direct application to NASA space vehicle development programs. We have made use of their high altitude rocket sounding programs in our work, however, and they have cooperated on any requests for information, etc. ✓

*✓ 2. METEOROID DAMAGE WORKING GROUP: ^{MSFC} This working group, made up of members from Aeroballistics, P&VE and Research Projects Divisions, has reviewed approximately 900 technical reports concerned with meteoroid damage and laboratory simulation of meteoroid impact. Committee members are carrying out discussions with experts in the field of meteoroid damage simulation. An MSFC position paper is currently being prepared. In addition to experimental investigations, the committee expects to determine the most satisfactory theoretical model now available for predicting impact phenomena. Dr. Harvey Hall, Technical Assistant to Milton Rosen, was contacted and he has requested that MSFC assist in the technical supervision of a meteoroid damage assessment satellite experiment being conducted by A. D. Little. Dr. Hall further suggests that someone at MSFC use a 2-dimensional code in an effort to establish a theoretical model of impact phenomena. Dr. Hall believes that this code, devised by Livermore Laboratories, will afford a rigorous solution. ✓

3. SA-4 ADDITIONAL MISSION: The Aeroballistics Division is strongly interested in the acoustical and buffeting measuring program proposed for vehicle SA-4. In line with this mission, a wind tunnel investigation to measure acoustics and buffeting pressure loads on a model of SA-5 is presently being instigated, with data expected by October 1962. It will be of great value assuming the SA-4 will carry the Douglas proposed mission to obtain flight measurements on the full scale vehicle at locations identical with those investigated in the wind tunnel test. This will be one of the first such programs to provide correlation between full scale and wind tunnel data. ✓

→ E.F.
Please explain in next "Notes"
B

B6-11

1. NASA QUALITY ASSURANCE MEETING IN WASHINGTON: Upon request of the Office of Reliability and Quality Assurance in NASA Headquarters, representatives of all NASA Centers, WOO, and JPL met in Washington on June 5 and 6 for an exchange of experiences in the implementation of the NASA Quality Publications NPC 200-1, -2, -3. I reported on the status of the implementation in the major MSFC contracts stressing the points that:

- a. the resistance against application of the documents by project managers in-house as well as in contractor's places is decreasing.
- b. the documents are usually very well received on the working level.
- c. for proper interpretation it is necessary to study the intent of the documents rather than the words since these documents furnish guidelines and are not a book of recipes.
- d. interpretation requires application of engineering judgement.
- e. the documents are project oriented and not department oriented, which means that all people working for a project (designers, test engineers, manufacturing engineers) have to cooperate and participate in the implementation in their respective areas. Only neglect of these duties invites interference by quality assurance or quality control personnel in areas such as design, qualification testing, manufacturing processes.

Mr. Morris Dyer of this Division reported on our experiences in dealing with the DOD agencies for support. He mentioned the improvement in attitude which provides for progress, emphasized the methodic approach which is required in the negotiations with the DOD agencies, and gave examples of supplementary information which has to be furnished to the DOD agencies for successful implementation of the NASA requirements of the document NPC 200-1.

Both reports were well received and supplemented by statements of the other Centers.

As far as the status in other Centers is concerned, the following was noticed:

Lewis Research Center has established a group of capable and dedicated people who work hard to do a good job. This group has utilized well the help we offered and has made remarkable progress in a short time.

MSC has hired several individuals with a good background in this field and has come a long way.

JPL is very close with us as far as the basic philosophy is concerned but, in the past, has lacked the capacity for proper implementation. The situation seems to improve.

The other Centers are struggling along and need more time to become efficient. ✓

1. CENTAUR EVALUATION:

a. Program for a complete and thorough evaluation of the Centaur vehicle as applies to Astrionics responsibilities was presented to Branch and Office Chiefs, 5/29. Flight Dynamics and Navigation Branches initiated immediate action for GD/A presentations in areas of dynamics and control. Other branches are examining their technical areas for a follow-up internal meeting on June 15 to review major findings. ✓

b. Fichtner has had a representative to AMR review the Complex 36A and 36B situation. This was a preliminary evaluation to examine the electrical GSE requirements in preparation of Astrionics Division's participation in the Complex 36B redesign. ✓

2. VISIT OF ASTRIONICS PERSONNEL TO MIT, 6/12: Personnel planning to attend meeting at MIT are: Mr. Moore, Mr. Richard, Mr. Thomason, Mr. Currie, and myself. Definition of the scope of work of a study contract which is in force with MIT/IL is to be discussed. The study will be directed toward redundancy considerations of the Apollo and the launch vehicle guidance systems. Because MIT is not in charge of the controls and autopilots, we will exclude any control questions in this study. Chilton of MSC will be present, and has indicated that a representative of the MSC project office might also attend. ✓

3. CRYOGENIC ADVANCED RESEARCH AND TECHNOLOGY PROJECTS: On 6/7, I held a meeting with Dr. Buchhold (GE), Dr. Harding (JPL), Mr. Kanter (Office of Electronics and Control, Hqs), and RPD personnel, concerning the application of \$750,000 on cryogenic gyros and accelerometers. It was concluded that:

\$150,000 be allotted for evaluation of existing breadboard hardware,

\$300,000 be allotted for material research,

and the rest be split for hardware remodeling and material research after the results of the evaluation are known (probably by the end of this year). I have more and more doubts whether a feasible system will evolve in the foreseeable future; thus, I favored the trend towards material research. Obviously, the Navy has similar feelings because the support of our cryogenic development has been terminated. ✓

4. DRIFT TEST OF AB-5 GYRO: Bendix E-P Division tested an AB-5 gyro in the compass mode. Over a period of 90 hours, with one temporary interruption, the north indication had a random error of 30 sec of arc, corresponding to an acceleration independent random drift contribution of the gas bearing of about 10^{-3} g/hour. ✓

5. STATUS REPORT ON C.S. MANPOWER STRENGTH: 916 authorized, 870 on rolls. Of 46 vacancies, we have 20 commitments. ✓

B 6-8

1. MANNED LUNAR LANDING MODE - The manuscript of the Earth Orbital Operations Book is nearly complete (7 volumes). Portions went to press this past weekend, and the remainder will go to press tomorrow (June 5). This is being published as a Marshall Technical Paper. ✓

We received a letter from Holmes on 5/28/62 calling for additional information for mode selection for EOR, LOR, Direct C-8 and Direct NOVA. They provided assumptions and launch schedules. We are to provide (a) costs thru FY 67, and second level backup schedules based strictly on the launch schedules supplied and (b) our critique on their assumptions and the affect on the data submitted. The launch schedules received are based on "earliest hardware availability" dates and are termed "success" schedules. For C-1, C-1B and C-5 they are not too different from our schedules particularly in view of the assumption that money was not to be a limiting consideration. For C-8 however, the schedule assumptions are so far off that one wonders what can be gained from the exercise. Jay Foster has been in Washington attempting to have this schedule revised but so far has been unsuccessful. No schedule was supplied for NOVA and we are to use our present schedules.

2. TECHNICAL PROGRAM COORDINATION MEETING - The second bi-weekly Technical Program Coordination Meeting was held May 31. Principal items discussed were FY 63 Budget exercise and the request from OMSF for cost data on the lunar landing modes. All data requested are to be submitted through designated Project Offices to M-CP and M-FIN, for coordination and submission to OMSF by June 15. ✓

3. SHUTDOWN OF LIQUID HYDROGEN PLANT - We have received word that the liquid hydrogen plant at West Palm Beach was shut down May 31 for two weeks because of a leak of hydrogen gas in the cold boxes. NASA headquarters (Mr. Bass, OMSF) is obtaining information on availability of liquid hydrogen on the West Coast in an attempt to supply our current requirements. Present indications are a shortage of liquid hydrogen for the next two weeks, which may affect acceptance of RL-10 A-3 engines scheduled for June delivery. ✓

4. PERT PROGRAM - We were successful in getting Office of Programs, NASA headquarters approval for continued use of 7090 Lockheed computer program by MSFC. This provides for the seven digits urgently required and previously requested by Marshall. ✓

Mr. Maus:
I would have
put this on
Holmes TWX.
9cm

So
could I
B

A.M.
We gave the sober truth on 6/7 Shea meeting suggest we give them cost figures for their impossible and our realistic NOVA schedule.
B

B 6/12

1. H-1 LOX PUMP PROBLEMS: Rocketdyne, with support from MSFC, has "listened" to all of the production H-1 engines here, with the exception of S-1-4, and these will be "listened" to tonight. Results should be known by Tuesday, 6/12/62 (tomorrow). ✓
2. CENTAUR: A request to do fatigue testing on a Centaur set of tanks has been reviewed and the results forwarded to the Centaur Office. Indications are that one month of schedule time for this testing could be gained if Centaur and other projects are willing to pick up the tab. Testing is presently planned for Edwards stand in 9/62. ✓
3. RL10-A1 ENGINE TESTS: A leak in the chamber of the only "fireable" engine at MSFC has made it necessary to postpone first firing at this facility. Steps are being taken to secure another engine and as plans become firm, a new schedule will be made. ✓
4. SA-T4: Static firing of SA-T4 is scheduled for 6/15/62. ✓
5. MARINE ACTIVITIES: Procurement action is underway for an option on the S/S "New Grand Haven" (former Miami to Cuba railroad ferry). Vessel planned for off-shore space-vehicle shipments by NASA and stage contractors. The option will cost the government one dollar (\$1.00) and will become binding when a price for the vessel has been agreed upon. Surveys will be held this week for condition and valuation. ✓
6. NUCLEAR FACILITIES: Following to be handled in a confidential way: We were approached by Harry Finger to participate in a field trip and discussions concerning a new location of the nuclear engine and stage test facilities. The idea is to shorten the distance of 87 miles from Las Vegas to Jackass Flats Test Site to a minimum. That means find a new facility site close to Las Vegas: a) Whenever possible as close as 45 miles distance (one trip), b) To use Las Vegas as living area with all of its "high living standard" and yet be safe against radiation effects and fall-outs. Messrs B. R. Tessmann and Varge Cornett were with the investigation party. Airplane, as well as ground, trips were undertaken with the result of having found one very favorable location, which will be checked on by meteorologists and geologists. The area would be 20 miles off Las Vegas Highway 95 (toward Camp Mercury) and about 23 miles north/east toward the Desert Game Range, and be located parallel to the Las Vegas Bombing and Gunnery Range. Mr. Finger participated in the field trips. If desired, we could give you more details. As far as our opinion goes: Find a place along the Atlantic Coast (e.g., King's Ranch, Texas) for simpler and cheaper transportation conditions, as well as better living conditions and easier hiring of good engineers and technicians. (E.g. Point Arguello on the Pacific Coast.) Should we pursue this very actively, actively, or passively?

K.H. ✓

I'd like to hear your story first
before I express my own views. B
(This kind of thing is very touchy,
public relations wise)

NOTES 6-11-62 NOELZER

B 6-12

1. COMPUTATION DIVISION COMPUTERS: For your information I am listing the digital computers, by Division in which the computer operates, over which I have cognizance.

<u>Division</u>	<u>Quantity</u>	<u>Type (Size)</u>	<u>Vendor</u>
<u>Computation Div</u>			
Scientific	2	7090 (large)	IBM
	5	1401 (medium)	IBM
	1	1620 (small)	IBM
	1	PB250 (small)	Packard Bell
Commercial	2	705 (large)	IBM
	3	1401 (medium)	IBM
<u>Launch Operations</u>			
Scientific	1	205 (medium)	Burroughs
	1	500 (small)	Libroscope
Commercial	1	1401 (medium)	IBM
<u>Aeroballistics Div</u>			
Scientific	2	1620 (small)	IBM
	3	RPC 4000 (sm)	Royal McBee
	1	G15D (small)	Bendix
	1	225c (medium)	General Electric
<u>Propulsion & Vehicle</u>			
Engr. Div.			
Scientific	1	1620 (small)	IBM
	1	RPC 4000 (sm)	Royal McBee
	2	225C (medium)	General Electric
	5	Recomp 2 (sm)	Autonetics
<u>Astrionics Div</u>			
Scientific	2	LGP 30 (sm)	Royal McBee
	1	225 C (medium)	General Electric
<u>Manufacturing Engr.</u>			
Scientific	1	Recomp 2 (sm)	Autonetics
<u>Research Projects</u>			
Scientific	1	Recomp 2 (sm)	Autonetics
<u>Test Division</u>			
Scientific	1	Recomp 3 (sm)	Autonetics

H.H.
You forgot
RCA 110 for automation
bread-boarding
B

B 6-12

1. SPACE STATION

We are presently compiling all available data useful for a preliminary development plan (PDP). Our proposal is based on the modification of a S-1C Lox tank as the basic structure. We are studying the use of the TITAN II-GEMINI, SATURN C-1B (also with a solid booster) and the TITAN III as a basic supply vehicle. This effort is in support of MSC. We should be ready for a presentation to you in about four weeks. If you need some information earlier, please let me know.

Please discuss with Lange what proposals M-SAT has received on "solid motors for C-1

class vehicles
Reference
his Note
6-11-62
to me,
Par. 1
WHO DOES
WHAT in
this area?

2. DIRECT AUTOMATIC LUNAR LOGISTICS VEHICLE

MSFC is this here We are in the process of compiling a preliminary development plan for a one-way C-5 lunar cargo vehicle, which should be available in draft form early in July. (Do you think we need it earlier?)

3. FUTURE PROJECT STUDIES

After negotiations of all our contracts of this fiscal year, we have approximately \$100,000 left in the "citty." Do you have anything in mind which you would like to get started? If not, we plan to make a parametric study of advanced nuclear systems and to buy a study of a "1,000,000 lb payload - 25 \$/lb super NOVA" based on Truax ideas.

4. OPERATIONS ANALYSIS

How strong do you feel about the type of operations analysis we did for the lunar mode study? Do you feel it was worth while, and should we sharpen our tools and continue this work for advanced launch vehicles, lunar base logistics, and manned planetary operations? We had the impression that MSFC Management was less than enthusiastic about our work during the APOLLO study. Let's discuss this, but don't worry; You all did a fine job.

5. NOVA

As a reminder, the NOVA Source Evaluation Board will meet the 20th of June (Director's Conference Room, 9:00 to 1:00). Due to events of the last few weeks, it is recommended that one study contract be initiated in July or August along the same general lines as was originally planned. You had ask for a "lay out" of the proposals and we could have them available whenever you desire - possibly Tuesday or Wednesday (12 or 13 June) in my office.

H.H.K.
When can you come up with a short description of this bird?

(Performance number and types of booster solids, TVC, overall dimensions, compatibility with complexes 34 & 37 etc.)

People often ask me what we mean with replacing S-1 boosters by solids, and what such a bird could do.

What kind of landing stage? H₂-O₂ using P & W engines?

Suggest you give the solid boosted CTB first preference.

Tuesday only day available B

Please expedite. B

NOTES 6-11-62 RUERS

B6-12

... Negative Report.

DIRECTOR

C

C

C

C

... ..

C

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C

B6-12

1. C-1

SA-3 - Booster transfer to M-QUAL for post static checkout is forecast for 6-19-62. ✓

SA-4 - Booster transfer to M-Test is forecast 8-13-62. Final resolution on secondary missions of hydrogen venting tests and/or a section of S-IV interstage should be made by 6-15-62. ✓

SA-5 - Start of booster assembly (6-25-62) appears doubtful due to additional changes in tail section design and late deliveries of the 20 cu.ft. spheres and of satisfactory TB & 105 containers. M-SAT recommends launch schedule slippage to August 63. suggest to make this subject to STD progress

S-IV - Hydraulic Actuator System - WOO was requested to authorize DAC to demand bids for new design. ✓

Instrument Unit - Astrionics Contractor - The Scope of work written by Astrionics and SSO has been reviewed. The modified version should reach you 6-12-62. It will contain a sole source justification. ✓

Chrysler Contractor - Negotiations scheduled for 6-18-62 at Michoud. ✓

Solid Propellant Motor for Future C-1 class Vehicles - Studies received from DAC, Lockheed, Space General, STL and G. E. Tempo. Technical evaluation will be presented to evaluation board 6-12-62. ✓

Schedules - Incorporation of the additional safety features in Battleship stand has been solved. Cold flow program now scheduled to begin the week of 7-2-62 and hot firing one week later. Last week you said 6-11, B

Instrumentation checkout in system integration area should be completed 6-22-62. ✓

All systems vehicle - Common bulkhead successfully bonded and removed from autoclave. A tooling problem was encountered in machining the angle and "tee" for welding operation. Impact of trouble not determined yet. ✓

2. C-5

Automation - Reply to Brainard Holmes letter on automation and its impact on C-5 and C-1 contracts has been coordinated with Pichtner on 6-9-62 and will reach your Office on 6-12-62. ✓

S-IC - Boeing overrun was minimized at \$.820 from \$.972. P&C was requested to apply all available Michoud FY-62 funds of \$.650 against overrun and cover balance of \$.170 with FY-63 funds in July. ✓

S-II - Funding Plan for acceptance test facilities at MIT was submitted to HQ's by M-FE. It includes requirements for \$28 Mill. C of F funds in FY-63. ✓

S-IVB - Approval request for new static test complex at SACTO was sent to HQ's. ✓

3. Mission:

JPL suggested informally that an Agena-B placed in low orbit by a 2-stage C-1 could escape about the same payload (4.8 - 4.9 K lbs) as the proposed 3 stage C-1 using Centaur. JPL preliminary calculation indicate feasibility of approach. ✓

JPL requested informally a dynamics and control study from MSFC to determine feasibility of a proposed JPL electric propulsion test vehicle using a 2-stage C-1. (Launching 1968-69)

Let's discuss this, though, in case we must commit ourselves now!

of Director MSFC

O.L.
Please
make up
with
VE
diagram

second generation, solid
boosted CIBB

O.L.
Is this coordinated with Koelle?
If not, let's do it. I've ask him
to furnish me a package on a

B6-11

Dr. von Braun's Comment to Notes 5-28-62, Lange

1. S-IV - Additional safety feature in Battleship stand:
No letter to Mr. Able required, issue has been settled at SACTO in the meantime. ✓
2. Extract from Notes 5-28-62 Grau
NASA Quality Publication NPC 200-2 to replace MIL SPEC Q-9838 - M-SAT for action. (In process. M-SAT requested WOO on 4-20-62 to investigate incorporation into contract without additional cost. If not possible, to have DAC price the impact.) ✓

1. PROPOSED OMSF DOCUMENTATION PROCEDURES - MSFC comments have been requested by OMSF on their proposed directive "OMSF Management and Program Documentation." This directive establishes several formal communications documents (Management Instructions, OMSF Authorizations, etc.) to be used by OMSF for controlling resources, directing program effort, disseminating program information and establishing management procedures. This is part of a concerted OMSF effort to systematize management documentation. We are reviewing this with other offices and divisions to make an appropriate reply to OMSF. ✓

(Suggest some informal contact with Hjernevik, MSC, also)

2. LUNAR LANDING MODE SELECTION - Divisions and offices are preparing scheduling and funding data for the Headquarters' prepared success schedules, in response to the OMSF request of May 25. We expect to receive input from divisions and offices June 11, and will assemble the submitted data, prepare summaries and present a coordinated package to you for approval. The completed and approved package is due in OMSF June 15, 1962. ✓

Jay Foster and Porter Dunlap of MSFC, and Mr. Fernandez, OMSF, visited MSC June 6-7 to coordinate assumptions and scheduling depth to be used in preparation of this submission. ✓

3. NASA LONG RANGE PLAN - Jack Waite, M-CP-P, will visit OMSF this week to work with OMSF in preparation of guidelines, assumptions, procedures, and format for revision of NASA Long Range Plan at the end of this year. We have not participated previously and hope to inject some Marshall thinking into next year's plan. ✓✓

4. PERT - Ray Crouch, M-CP-E and Clayton McGee, M-COMP, have been appointed as representatives of MSFC on "NASA PERT Computer Program Working Group," being formed by NASA Office of Programs. The purpose is to compile a standard computer program for NASA. Initial meeting is June 11-12 in Washington. ✓

A meeting was held at MSFC June 5 with M-SAT and Douglas Aircraft regarding plans for implementation of PERT on S-IVB contract. A meeting was held June 6 with M-SAT and Chrysler to review progress to date for S-1 (Michoud). Meetings and progress were satisfactory. ✓

5. MANAGERIAL DATA CENTER - Ray Kline visited MSC June 6-7 with Mr. Fernandez of OMSF, regarding Data Center plans. NASA headquarters is interested in establishing chart standards and a basic consistency of the managerial data that will be maintained in all centers. Mr. Armstrong of OMSF, will be here this week for further discussions on this subject. ✓

B6-12

1. Last Week's Presentations:

(Monday, June 4 through Thursday, June 7, 1962)

The presentations of your Staff Members were outstanding, and were excelled only by your own comments and summaries.

*A.R.
We know.
(Thanks, anyway)*

2. Comments on Presentation by Others:

I heard many favorable comments, especially from the Bellcomm people and the System Support Group (JPL) of Shea's Office, after the review of last Thursday. ✓

3. Presentation by MSC to Bellcomm and System Support Group (JPL) (Similar to the one by MSFC):

I understand that the MSC presentation was sort of "sloughed off" and not impressive at all, while MSFC's was outstanding. ✓

4. My Discussion with Shea on Choice of Mode:

During Shea's stay in Huntsville (Tuesday through Thursday) discussed mode several times with him. He seemed to favor C5 direct. I had impression after your Thursday presentation that he was quite impressed, especially by your summary. He seems to swing around to LOR, but didn't commit himself. ✓

(Inputs from STL study contract still outstanding. Due at Shea's by 18 June). ✓

B6-12

1. BOOKING PERSONNEL: Number on board as of 6-6-62: 265.

Chief

2. S-DE PROPOSAL EVALUATIONS: Due to the fact that it is not possible now to utilize Boeing inhouse personnel in evaluating proposals for *him* development items to be placed under contract, this Division finds ~~it~~ self squeezed into a corner as far as FY-62 contracting is concerned. There may be several items which will not be contracted for due to this reason. Our civil service people are completely overloaded and depend upon the support given by inhouse contractors. *W.M. O.K. I'm all with you B*

3. CENTAUR: The preliminary results of an investigation of the second consecutive failure of the Centaur gimbal during hot firing reveal several deficiencies in the gimbal, which include design, lubricant, manufacturing, and quality control. Corrective action has been initiated, under direction of this division, to correct these problems on future gimbals; however, retrofitting of all gimbals on hand at P & WA will be required.

4. S-IV: Our aerodynamic heating studies indicate that the external skin temperatures of the forward interstage are approximately 600°F, which is 300°F higher than that estimated by DAC. Based upon this and contingent upon structural and material requirements, we recommend that the entire forward interstage be insulated with Thermolag or a lighter and better material. A more detailed presentation will be made at the next P&VE C-1 meeting. *Hope mech. work group passes our findings onto DAC B*

5. LUNAR ORBIT RENDEZVOUS: P&VE provided a member to the OMSF Ad Hoc Committee on LOR which met periodically during April and May. The committee was charged with the investigation of the propulsion system to be used on the Lunar Excursion Vehicle and provided recommendations to Dr. Shea. The deliberations of the committee will be published, but essentially their recommendations are to be:

- a. Pressure-fed system ✓
- b. Storable propellants (Mixture of Oxides of Nitrogen and Hydrazine-type fuel) ✓
- c. Fully staged (separate tankage and propulsion systems for descent and ascent maneuvers) ✓
- d. Variable thrust (3.75 to 1) single chamber, for descent ✓
- e. Fixed thrust, single chamber, for ascent ✓
- f. Regeneratively cooled thrust chamber ✓

LOX/LH₂ were considered, but it appeared that the gain in performance was too little to warrant the acceptance of the additional problems. The LOX/LH₂ system has little advantage over earth storables due to lower propellant mass fraction characteristics of the small system. Deep throttling and ablative chambers were considered to be advanced state-of-the-art for the development schedules that are anticipated for the Lunar Excursion Vehicle. ✓

6. RIFT: Headquarters has informed us that the FY 63 budget for the RIFT Project will be \$15 million instead of \$25 million as previously programmed. ✓

h this
strictly
a hard
vacuum
problem?
B

(12)

B6-12

NOTES 6-11-62 Stuhlinger

1. ADVANCED RESEARCH AND TECHNOLOGY: Mr. Jules Kanter of OART visited MSFC on June 7 and 8. Mr. Kanter works for Commander Kelley in the OART program area of "Electronics and Control" and has cognizance over the "Guidance and Navigation" sub-program. Mr. Kanter met with Dr. Haussermann, Mr. Chase, and others from Astrionics Division and with Mr. Robinson and Mr. Downey of RPD. The visit with Mr. Kanter was in many respects much more gratifying than our recent meeting with Mr. Sloop's group. It seems that Commander Kelley and his people will "play ball" with us. Mr. Kanter indicated that he and Commander Kelley were particularly pleased with the fact that MSFC had submitted detailed plans to OART for the FY-1963 LVT program (no other center has submitted task forms), and that our responsiveness and cooperative attitude would certainly influence the funding which we would be allotted. He apologized, however, for the fact that some budget cuts would be unavoidable because of overall funding limitations.

2. OMSF LAUNCH VEHICLE TECHNOLOGY PROGRAM: We met with Mr. Canright of OMSF on June 8 to discuss OMSF plans for the FY-1963 LVT Program. He indicated that no official guidelines had been issued concerning an OMSF FY-1963 LVT Program, but a preliminary plan proposed about 9.3 M, and some 6.5 of this funding was earmarked for MSFC. Mr. Canright suggested that we should review our FY-1963 LVT submission of March 15 to OART (the "big book") and select those projects which we felt were more directly in support of OMSF vehicle programs. OMSF would consider funding these investigations. (It appears that OART will be able to support only about 50% of the 25 M program which we submitted for FY-1963. OART funding guidelines are expected soon.) The OMSF FY-1963 LVT Program will be discussed between OMSF and RPD in a week or so, after OMSF plans have been better defined.

Or Sloop??
Or call
to that
shall I
live up
Sloop
doesn't live up

RPD

→ I'm still waiting for that requested letter to Tom Dixon, to be drafted by RPD, reminding him of our understanding that MSFC can spell out "tasks" within "task areas" without OART's o.k.

→

B6-12

*✓ 1. F-1 ENGINE PROGRAM: A meeting was held 6-6/7-62 at MSFC with Rocketdyne top management to review the Rocketdyne F-1 Engine Program Plan and to discuss the Rocketdyne proposed cutback in technical areas of engine development due to the NASw-16 contract overrun. In the near future Rocketdyne and MSFC will jointly rewrite the F-1 Program Plan to include all mandatory effort and identify those areas that may be deferred to the "Follow-on" Program.

A summary of various 4000 PSI hydraulic systems for the F-1 engine has been released. This summary also includes the current 1800 PSI Rocketdyne system.

*✓ On 6-6-62, two full-duration full-thrust firings of the F-1 Engine were scheduled. Engine #007 was terminated after 60 seconds. Engine #005 successfully completed the 2½ minute test. No further information is known. Tests were at 1,500K thrust level. ✓

M { 2. J-2 ENGINE PROGRAM: The high pressure LOX tank on VTS-1, which was damaged by fire on 5-24-62, has been inspected by a state safety inspector and rendered re-usable after repair, without recertification. The repair time has been estimated at four weeks. Rocketdyne has proposed moving a similar high pressure LOX tank from CTL-3 to VTS-1 to minimize the stand down time. ✓

*✓ 3. H-1 ENGINE PROGRAM: Rocketdyne representatives are present at MSFC this week to examine turbopumps on all MSFC Flight Engines. Special sonic test equipment has been furnished by Rocketdyne for use in this testing.

Testing at Rocketdyne indicates that tube splitting on the 188K engines is caused by the hypergol spray pattern. The hypergol spray nozzles have been modified on R&D test engines and testing is now in progress. ✓

*✓ 4. RL10A-3 ENGINE PROGRAM: PFRT is proceeding satisfactorily. Thirteen runs have been completed satisfactorily. No difficulties have been noted. ✓

5. M-1 ENGINE PROGRAM: Detailed Model Specification discussions were successfully completed this week on the M-1 Program. The M-1 Quality Control Plan is being reviewed. Aerojet is balking on the funding support of land acquisition and severable facility procurement for the "J" test area at Sacramento but it is believed that their desire to retain the proximity of this will force a change in this approach. ✓

HW
→ Could I see this? (I'm just curious)
B

June 18, 1962

B 6/19

*1. PLANT MODIFICATION

- gsm a. A design package has been prepared for removal of selected portions of the overhead steelwork in the manufacturing area. P&C advertisement for bids was released on June 16, 1962, and the Bid opening is scheduled for June 29, 1962.
- b. Load tests on various portions of the manufacturing area floor have been performed, and data is being reduced. Preliminary examination of the data indicates the floor to be adequate to support expected loads. The only floor breakout now considered necessary will be to accommodate special machine & fixture foundations.
- c. The configuration on the high bay area to be constructed has been decided upon. An inside area dimension of 180' x 200' with a nominal height of 200' meets all requirements agreed upon with M-ME, M-QUAL and M-MICH. Also, the revised cost estimate for the facility falls within the budget. ✓

*2. COMPUTER FACILITY

- gsm We assumed occupancy of this facility on June 15, 1962, as per our "use agreement" with GSA. ✓

3. BOEING CONTRACT

- a. The three month scope of work for the contract extension was submitted by M-SAT and M-MICH. P&C was not to request a proposal from Boeing until Dr. Langa has discussed the extension with NASA Headquarters.
- b. A purchase request is in P&C to supplement the Boeing Contract for a plant modification effort costing an estimated \$946,000.
- c. It has been decided to manufacture the "Y" Rings for the in-house S-IC vehicles at Michoud. Tools and equipment required for this effort are being expedited. ✓

4. CHRYSLER CONTRACT

Chrysler supplied design criteria for plant modification is getting behind schedule. We are trying to expedite this effort. ✓

5. MASON-RUST

The Mason-Rust follow-on contract has been negotiated. This contract is scheduled to be forwarded to NASA Headquarters for approval today. ✓

NOTES 6-18-62 DEBUS

B 6/19

1. Conference on VLF-39: A letter is in preparation to Holmes summarizing the decisions and recommendations reached during the meetings of June 12 and 13 at LOC. Problem areas will be discussed at the Management Council Meeting this Friday. Detailed minutes will be published in two to three weeks. ✓

2. Apollo-Saturn Launch Operations Panel: A panel meeting is scheduled for June 20. MSC Pre-Flight Operations Division will chair the meeting. Fourteen agenda items are scheduled and contractor participation is planned. Sub-panels will be organized to provide direct technical liaison at the operating level. ✓

* 3. Mercury-Net vs SA-7 and SA-8: MSC has asked us to fly the Mercury Network with SA-7 and SA-8. Sandler's organization has been requested to re-examine this possibility and determine:

a. Will instrumentation coverage be adequate:

b. What instrumentation support does LOD require to use the Mercury Net? ✓

4. Real Estate Acquisition: Real Estate Directive Nr. 12 has been issued for initial acquisition of land in Area III, including right of way for road between Orsino intersection at A1A and extending west to Indian River. ✓

* 5. Saturn C-5 Alignment: Astrionics has been informed of the alignment problems of the C-5 Launch Vehicle and Spacecraft with respect to the 39 concept of operations. They will discuss the problem areas with MIT this week and update their personnel on all known facets of the vehicle and launch environment. A solution for the Launch Vehicle Alignment problems seems possible at first examination. ✓

6. Diluzio's visit was concluded Wednesday. Looks promising. He will let me know within two weeks of his decision. ✓

B6/12

1. DAVIS-BACON ACT - Paul Styles has completed a simplified procedure for the application of the Davis-Bacon Act to MSFC construction projects. This was accomplished over a few weeks time. It will be of considerable assistance to NASA construction managers; particularly at Michoud. ✓

2. WATER WAY CROSSING OF INTERSTATE 10 - This project is still under study between the Bureau of Public Roads and NASA. The Bureau of Public Roads and the State of Mississippi would like to have a tunnel, and they are working to bring the cost down. Estimated cost at the present time for the tunnel is approximately \$10 million. In comparison, our 65 foot high bridge is now estimated to cost \$6.3 million. Further discussions will have to be held before a final decision can be made. ✓

Harry:

I would have marked item 2 for Holmes TWX. My marking the NOTES of others is a little inconsistent with our deleting items like 2. Would you like for me to start marking your notes? I will take no action unless I hear from you. 6-18

Buddie, add one or two sentences saying what the Act is. 7-11-62

Amended by note Buddie 7-11-62 BH

DAVIS-BACON ACT: This act provides that construction contractors will pay their employees a minimum wage which is established in each locality by the Dept. of Labor. Construction contracts whose total value is below \$2,000 is exempt from this provision. ✓

Ba/19

- * 1. SYSTEMS CHECKOUT AND PREFLIGHT TESTING WORKING GROUP: The Working Group met for the third time with DAC on S-IV May 15 and 16. The following open areas exist: (1) DAC does not plan any routine electrical checks on the stand following static firing. M-TEST disagrees; (2) DAC plans no "external stimuli" calibration of instrumentation during post-static checkout. M-QUAL disagrees; (3) DAC plans for the static firing to be the stage buy-off. M-QUAL disagrees.

The second Working Group Meeting with NAA was held May 28 and 29. Several open areas exist and were presented at the S-II Engineering review on June 13. They are listed as follows: (1) Engineering Prototype automated complex; (2) Methods of component testing; (3) Spares policy; (4) Manufacturing Checkout; (5) Checkout of static stand at Mississippi Test Facility (MTF); (6) Dwell time on static stand at MTF; (7) Stage movement at MTF. ✓

2. QUALITY ENGINEERING: During past week, personnel of the Quality Engineering Branch traveled to Sacramento, California to discuss NPC's 200-1, 200-2, and 200-3 with Air Force Quality personnel at Aerojet-General and to Los Angeles, California, to make a presentation, "Quality Approach at MSFC" to the Inspection Division, Los Angeles Section, American Society for Quality Control. Personnel are presently on TDY to NASA Headquarters to discuss MSFC position on the IBM Computer contract wherein IBM has requested a large sum of money to incorporate NPC 200-2. ✓

3. CENTAUR: A letter requesting incorporation of NASA Quality Publication NPC 200-2 into the General Dynamics/Astronautics Centaur Contract was forwarded to the Light and Medium Vehicles Office on June 14. (A Quality Engineering Survey of Minneapolis-Honeywell, Minneapolis, Minnesota was conducted during the past week, with concentration upon the Centaur Guidance System. Eight people from Quality Assurance Division will be in San Diego this week in connection with the Centaur Evaluation being performed at GD/A.) ✓

4. CHECKOUT EQUIPMENT: Drawings of checkout equipment used by Quality Assurance Division are being transmitted to Michoud Operations. ✓

5. APOLLO RESIDENT MANAGER ORIENTATION: Mr. George Lemke, the resident manager of the MSC office at S&ID, NAA, Downey, California and his assistant, Mr. Harvey W. Fritz, were guests of the Quality Assurance Division on June 14th and 15th for orientation on MSFC activities with emphasis on our activities. ✓

- * 6. SA-4 GEAR BOX NOISE: Engine 1053, position 7 was noted to have excessive noise level. The turbine was removed and subsequently disassembled for visual examination. Visually there is no apparent cause for the noise. The investigation is continuing. ✓

22
These
are the
things we
should
clearly
define in
the
contract.
Then there
can be
no
argument.
D 6/19

B_{6/19}

NOTES - HAEUSSERMANN, 6/18/62

No submission for this week.

B 6/19

1. Fearless Leader gone to Smokies.

2. NUCLEAR FACILITIES: (a) Reference NOTES 6/11/62 Helmburg, about new location of the nuclear engine and stage facilities: We were informed through Mr. Finger's office that this concern is a 'dead issue'. It was just another exercise. Political matters and additional funding requirements were reasons for disapproval. Mr. Tessmann knows about the whole story. ✓

(b) On Wednesday, 6/20, there will be a presentation given by Bechtel Corporation about the Nuclear Vehicle Systems Test Facilities. This is to close out these conceptual studies. Meeting will be in Test Division Conference Room at 9 a.m. ✓

3. H-1 LOX PUMP BEARING PROBLEM: Disassembly of engine H-1053 from S-1-4 stage revealed rough spot in No. 2 fuel pump bearing. Bearing has been sent to Rocketdyne for detailed dimensional check and inspection. Rebuilt turbopump has no unusual noise; therefore, it must be assumed that no. 2 bearing was the culprit. ✓

4. RL10A ENGINE: Leaking chamber from engine 1728 has been sent to Materials Laboratory for failure analysis. Word from PAVE-DEM and Centaur is that Test Division will receive engine 1713 within next 10 days as a replacement for 1728. If true, we can probably fire sometime in July. ✓

5. SA-74: Firing for 30 seconds presently scheduled for Tuesday, 6/19/62. Reason for schedule change: Just not ready without using excess overtime. ✓

6. SA-5 SHORT CABLE MAST: One hundred actuations under simulated vehicle lift-off conditions were successfully completed on the prototype short cable mast for SA-5. This completes the prototype testing of the mast. ✓

* 7. NAVINE ACTIVITIES: (A survey was held onboard the ferry, 5/3 New Grand Haven, Tuesday, 6/12/62. Surveyors from the United States Salvage Association and the U. S. Coast Guard submitted preliminary reports on condition and valuation, Friday, 6/15/62. Condition has been declared very good; market value approximately 1.3 million dollars. Total cost to modify and retain classification status, \$375,947.00.) ✓

Procurement action (on a reimbursable basis) for small craft to be used at MTF is underway. ✓

ATTACHMENT: * NOTES 6/11/62 Helmburg

NOTES 6-18-62 HOELZER

Bc/19

Negative report.

B6/19

1. CENTAUR:

- a. Centaur Program: Dr. Morrison, OSS, will be at MSFC on Wed., June 20, to discuss the Centaur development program. Presumably, he will bring with him a letter which has been in preparation at NASA Hq., outlining the new and desired program. It is hoped that the Wed. meeting will result in a firm development program upon which we can prepare program planning. ✓
- b. Centaur Guidance: On Thurs., June 21, a meeting will be held at MSFC to discuss the matter of follow-on guidance sets for Centaur. ✓
- c. Sycamore S-4: Repair of Sycamore Test Stand S-4 has begun and is progressing on schedule. The stand is expected to be ready to accept Centaur F-2 during the first week of July. ✓
- d. Sycamore S-1: There is a strong probability that the Air Force will not repair the Sycamore S-1 stand (one destroyed by Atlas explosion) for their use. If they do not, we will obtain this facility and rebuild as a Centaur static test facility. ✓
- e. Instrumentation: An extensive program is currently underway to add substantially more flight data instrumentation to Centaur vehicles F-2 and F-3. ✓✓

2. AGENA:

- a. Mariner R: The problems experienced with the delivery of the Atlas booster for Mariner R-1 and expected for Mariner R-2 appear to be resolved. On Friday, word was received from our representative at Space Systems Division (SSD) that the use of a flight certified C-133 aircraft has been obtained. Atlas booster 179-D will be loaded on Monday, the aircraft will leave San Diego Monday night and arrive at Cape Canaveral early Tuesday morning. This will meet the delivery date requirement for the booster. ✓
- b. Eccentric Geophysical Observatory (EGO): Representatives from this office attended a pre-negotiations meeting at Lockheed this past week on LMSC cost for the EGO program. This was a fact finding and information type meeting held prior to the formal negotiation to begin early in July. Lockheed's cost proposal is for a sum of 6.216 millions, and is exclusive of launch services. ✓
- *
gsm c. Facilities (Gemini): The Air Force has agreed to modify Pad 14 at AMR so that it can be used by an Atlas-Agena vehicle combination. The Air Force will fund for this conversion and handle all the design and modification effort. This office is now making arrangements to incorporate all GEMINI peculiar requirements into the modification to support the GEMINI launches. ✓

NOTES 6-18-62 Koelle

B6/L9

No notes this week.

B6/19

- * 1. C-1 Tankage Program: Due to (1) delays experienced with rail shipment, (2) damage incurred as a result of humping, and (3) the basic need for a secondary transportation system, investigations have been going on to deliver the 70" and 105" tanks by truck. The first 70" fuel tank transported by truck has been received and it appears this method of transportation may be superior to that of rail. ✓
2. Facilities: Partial occupancy of the new addition to our Engineering Building was accomplished this week. Full occupancy is expected by July 1. ✓
3. Republic Aviation: As you know Republic has been on strike for approximately two months. Republic Aviation supplies Tail Section, Fin, and Instrument Container components for the C-1 Program. Due to this strike, manufacturing operations at Republic have been accomplished by salaried supervisory personnel and this has resulted in many deviations and non-conforming parts resulting in an additional strain on our operations. ✓
4. Centaur: During the past week the Fabrication Group, a component of the Systems Ad Hoc Committee, has been engaged in an extensive analysis of all available engineering drawings and specifications of the Centaur. This knowledge of the basic structure and general requirements will serve as a foundation for the detailed survey to be conducted this week on the manufacturing techniques being used by General Dynamics. ✓
- * 5. S-II Stage: One of the major objectives of this month's S-II Assembly Working Group Meeting was to pass on to NAA manufacturing personnel all the experience and insight gained to date in the manufacture of the S-IV at DAC. Particular emphasis was placed on manufacture ramifications of the common bulkhead design and the manufacturing procedural changes required to minimize their impact on the schedule. As a result of this meeting MSFC is forwarding to NAA special tool design drawings, and in return, NAA will supply us with R&D reports on welding power supply analysis. NAA has agreed to introduce some procedural changes and refinements, such as the addition of inspection steps in the cleaning process, which we feel desirable. ✓

B6/19

1. C-1

SA-5 - It is necessary that the two-month slippage be recognized at this time. (Notes 6-11-62) See attached memo. Additionally, premium time is presently being expended against the June schedule, and some can be eliminated as the schedule is adjusted. ✓

S-IV - There is a slight chance that cold-flow of 6 engines could start this week. We will have a group from M-P&VE, M-TEST, and M-SAT at SACTO to do an independent evaluation of the cold flow and initial hot tests. ✓

* CSD Contract - Formal negotiations are scheduled to start 6-21-62. ✓

* FY-63 Funding - Require approximately 50 Million more than Congressional authorization. ✓

2. C-5

S-IC - Proof draft of the MSFC/Boeing Program Development Plan was completed and is currently undergoing review.

A scope of work for a three months extension of the Boeing Contract has been forwarded for action to the Contracting Officer's Rep. M-SAT has developed reserve plans for continuity of Boeing contract coverage in case HQ's disapproves the interim contract extension and directs a definitive contract for the total program by 7-31-62.

In 6-12-62 meeting NAA recommended a single plane S-IC/S-II separation scheme at station 196. No decision was reached, since the impact on the S-IC design could not be assayed during meeting. Study is continuing. ✓

S-II - After several discussions, the contractor was directed to prepare to negotiate the firm cost proposal and system data documents that were presented to MSFC on 5-21-62, but that they should prepare *estimates* (Budget & Planning) on various items for possible reduction in the scope of work.

On 6-12-62 S&ID briefed MSFC on proposed move of the manufacturing and design of certain details to Tulsa. They were directed not to plan any work at Tulsa. ✓

In the 6-13-62 Design Review with S&ID at MSFC the working group chairmen presented status of the various working groups. ✓

* S-IVB - Procurement plan to place a hardware contract by 7-31-62 was jointly prepared with WOO. Accordingly, DAC was requested by WOO to provide detailed cost information supporting their 5-1-62 recommended program for the 260" diameter stage (160M total program). ✓

Dr. von Braun's Comments to Notes 6-11-62, Lange

B6/19

1. SA-5 schedule slippage to August 1963.
(See Notes 6-18-62, Lange -- SA-5) ✓
2. Solid Propellant Motor for Future C-1 class Vehicles
- Coordinated with Koelle?
(Study has been a joint action with Mr. Koelle since the start.) ✓
3. S-IV Cold Flow Program. - Last week you said 6-11-62.
(See Notes 6-18-62, Lange -- S-IV) ✓
4. JPL Suggestion - 2 Stage C-1 using Agena B versus 3 Stage C-1 using Centaur to escape almost same payload (Taken up with P&VE, Mr. Schramm.) ✓

Notes 6-11-62, Debus

LOD - Douglas - Chrysler Relationships. - SAT properly cranked in?
(M-SAT is with LOD on these actions) ✓

Notes 6-11-62, Gorman

S-II Test Complex. - Have they gone thru M-SAT? Who is behind this?
(M-SAT, Mr. Field, concurred with M-PE package. Mr. Canright says it is political. It seems that Mr. Webb made a commitment to some congressmen that S-II would be acceptance tested at Mississippi Test Facility. Now HQ's program people (Mr. Lilly) are funding the C of F monies - \$28Million in FY-63 and \$4.5Million in FY-64).

plus safety aspects, which
make full duration tests
with SII prohibitive at Santa Susanna!

B

B 6/19

1. VISIT OF MIT PROFESSOR ON PROJECT MANAGEMENT - Professor Don Marquis of Massachusetts Institute of Technology will visit MSFC Thursday and Friday of this week, concerning project management. MIT is studying techniques of project management under a grant from NASA Headquarters. We are arranging appointments with key MSFC project management people, including Dr. Lange, Mr. Hueter, Mr. Belew, and Mr. Koelle, and chairmen of some of the working groups. Headquarters advises that during the summer, several of the MIT professors will visit the different NASA Centers to analyze how each Center manages its projects. ✓

How did we make out?

2. OFFICE SPACE IN BLDG 4488 - We have some relief in sight for the growing pains we have experienced due to lack of enough space for our people. We have reached an agreement with Dr. Hoelzer for space for our PERT people in Bldg. 4663, in exchange for space in Bldg 4723. This will give us working area for Managerial Data Center and accommodate some of our new hires. ✓

3. OMSF PROGRAM DOCUMENTATION - Chris Andressen and John Goodrum will be at MSC this week to discuss OMSF program documentation (the NASA directive discussed in the board meeting Friday) with Wes Hjernevik and Chuck Bingman. ✓

4. OART APPROVAL OF RESEARCH TASKS - After the Board Meeting Friday, we continued the discussion of the problems resulting from Dr. Seaman's letter of June 8 concerning the requirements for individual task approval for research projects. Since Mr. Heller will be on TDY all week, it was agreed with him that M-CP will continue to investigate this problem during his absence and be prepared to meet with Dr. Rees early next week to determine what action should be taken at the Washington level. Norm Rafel will be in Huntsville Tuesday - we will take up the problem with him. ✓

5. GRUMMAN-RCA PROPOSED PRESENTATION - As you know, Grumman and RCA have joined forces in a proposal on Excursion Module. They gave a presentation to George Lowe and to Houston people. They are willing to come here to give us the same briefing and would prefer the week of June 25. Being so close to a mode decision, do you think it would be appropriate for us to invite them here at this time? OK in my opinion. gcm

I'm interested, even if it means the briefing B gcm

* 1. RIFT: The RIFT contract with Lockheed has been negotiated at the lowest fee in Lockheed history. Lockheed is now working on RIFT and incurring costs as of 6-11-62. Time from selection of contractor to completion of negotiations - 23 days.

Lockheed has requested the Air Force to extend the lease on Georgia Nuclear Laboratory (GNL) at Dawsonville from one year to five years based on RIFT requirements. Since the Air Force has no apparent use for the facility, NASA may be asked to take it over. MSFC would like to have it.

Personnel of Space Nuclear Project Office-Cleveland (who asked not to be identified) revealed that Lewis Research Center is preparing the requirements for a facility capable of running simulated flight tests on complete nuclear stages such as RIFT. The information inferred that a basis for justification would be the cost saving by elimination of flight testing by use of this facility. ✓

WM
I'm interested
Please button
up with
B
2. MANNED SPACE STATION: Structures Branch has completed its first feasibility studies and design concepts for a manned space station, and is ready to make a presentation to you at your convenience. ✓

3. SOLID PROPULSION TECHNOLOGY (Fiberglass Case): Proposals were solicited from twenty firms on a fixed price basis. Only two companies (Hercules Powder Company and Black, Sivalls and Bryson) responded in accordance with this request; four responded with CPFF proposals, six declined to bid and eight did not reply. Efforts are being made to negotiate a contract with Black, Sivalls & Bryson. *Wasn't this the project Seamans wanted*

4. LARGE SOLID MOTORS: Aerojet fired the largest (in length, weight, thrust and total impulse) solid motor on 6-9-62. A burn-through occurred in the aft end of the case at about 71 seconds resulting in extensive damage to the test stand. Several reasons for the failure are being studied but nothing definite is available at this time. ✓ *as to cancel? What happened?*

5. BOOKING PERSONNEL: Onboard as of 6-14-62: 289. ✓

6. CENTAUR: Ref. par. 3, Notes Mrzek 6-11-62 (Attachment). The problem is combined hard vacuum and cryogenic temperatures. ✓ *B*

Attachment: Notes Mrzek 6-11-62

B 6/19

1. Mission Plans and Schedules:

While sometime back Payne and Sneed of my office worked with members of Shea's office in preparing the optimistic plans and schedules (ref Notes 5-28-62) they have recently been working on conservative plans and schedules and are presently in Washington on that.

I got request on last Friday P.M. that they be in Washington all this week of June 18 on schedules and also to help in putting urgently together a document for Holmes on the selection of mission mode (This could be for next Management Council Meeting). ✓

2. Reports of Members of my Office on Working Group and Panel Meetings:

As you will remember, members of my office participate in Working Group and Panel Meetings as observers.

I have asked them to write "Observation and Recommendation Reports" These reports will be forwarded to Dr. Shea. It was my intention to also send copies of these reports to Working Group and Panel Chairmen & members and others as appropriate, however, Shea thinks that Rosen and others might consider this an intrusion into their realm. While I could follow Shea's reasoning, I nevertheless, had to point out to him that on the other hand - if not you p your Working Group and Panel members would resent getting "the word" from Washington.

We finally compromised that my observers would verbally transmit the contents of their reports to concerned members of MSFC.

3. My Travel:

O.K. Let's see
how that works out
B

I will be on TDY from Monday, June 18 through Thursday, June 21, 1962.

a. Monday through Wednesday: Miami - Meeting of Executive Committee regarding Space Electronics and Telemetry Symposium.

b. Thursday - Participate in meeting of OMSF Reliability Board in Washington. (Eberhard and H. Schulze will participate also). ✓

4. My Annual Leave:

I will be on annual leave from July 2 through July 27, 1962. ✓

During this time Howard Burns will write the notes. ✓

P.S. Latest information received at 5:30 p.m. on Friday: Document for Holmes to be ready by 22nd of June; to Seamans on 25th of June; and to Webb on 28th of June. ✓

90m

B 6/19

Mr. Weidner
and
Dr. Lange
request
your
comment
B

1. SUPPORTING RESEARCH: Reference is made to discussions during the Board Meeting on June 15, and further discussions I had with Dr. Harvey Hall the same day. We discussed the three main sources of money for our MSFC research needs: OART, OMSF supporting research (tentatively 6.5 millions), and hydrogen technology not covered by these sources. He doesn't presently see a possibility for additional funds from Seamans for the H₂ technology, although he emphasized himself the vital importance to the overall NASA program. He thinks that our best bet is to write the hydrogen research problems into the stage and engine contracts as separate task assignments as already discussed by you. This can be done after we know accurately what will be funded in OART and OMSF research programs.

E.S.

Don't
under-
stand
this!
??
B

Package came
in and McCall
sent it to
Mr. Rens for
info + action.
6/20/62

We are preparing for you a package consisting of the OART guidelines just received, the earlier OART guidelines and results of the February 1 and 2 visit by Tom Dixon and his staff, and a resume of the outstanding differences between them. In the guidelines just received, OART has indicated that they prefer not to support technology programs which involve no real research or advancement in the state-of-the-art. As mentioned in the NOTES of 6-11-62, we were quite pleased to learn that OMSF will probably provide some funding for supporting technologies to fill the "gap" that seems to be forming. Mr. Norm Rafell of OMSF will be here on June 19 to discuss the OMSF FY-1963 supporting technology program. ✓

2. RESEARCH INSTITUTE: The preparation of the June 21 presentation to Mr. Webb for support of the University of Alabama Research Institute has been completed. It was reviewed with the University of Alabama people, including Dr. Hermann, at Tuscaloosa on Saturday, June 16. ✓

3. NEW EMPLOYEE: Mr. H. E. Stern, a veteran of 14 years work in the nuclear radiation field came on board last week. He will be Dr. Shelton's deputy in the Nuclear and Ion Physics Branch. He has completed all the course work for his PhD in mathematics and he will work closely with the topological dynamics investigation going on at the Research Institute. ✓

4. NASA SPACE SCIENCE STUDY: During this week (June 18 to 22) I am going to attend a portion of the NASA Space Science Study at the State University of Iowa. Dr. Stuhlinger is going to attend the concluding session after his return from Germany. During this week of my absence, affairs of RPD will be handled by Dr. Shelton and the other Branch Chiefs in their specific fields, and by Mr. Bucher. ✓

How about our
solid propulsion program?
(see next page) B 6/19

GEORGE C. MARSHALL SPACE FLIGHT CENTER
HUNTSVILLE, ALABAMA

Memorandum

TO: M-DIR, Dr. von Braun

DATE June 14, 1962

FROM: M-RP-DIR

SUBJECT: Proposed letter to Dixon concerning Mr. Sloop's Program Operation

1. I would like to bring some points to your attention in connection with a subject discussed in the attached copies of the weekly NOTES prepared by RFD. (Incidentally, we did not receive your comments in the NOTES of 6/4/62 until 6/11/62, after we had already submitted the NOTES of that date.)

2. The technical area "Chemical Propulsion", with which Mr. Sloop is mainly concerned, is most closely associated with the Liquid and Solid Propulsion Technology Programs, which are presently under the direction of Mr. Mrazek and Mr. Weidner. (Mr. Chandler is the Program Manager of the Liquid Prop. Tech. Program and Mr. Brown the Solid.) Mr. Sloop has indicated that MSFC can expect to receive \$1.1M in FY-1963 from OART for Chemical Propulsion. Of this \$1.1M, some \$3.1M is proposed in connection with continuations of contracts and follow-on work connected with the present Liquid and Solid Propulsion Technology Programs. Only about .4M is for work proposed under LVT.

3. In view of the fact that Mr. Chandler has the biggest stake in Mr. Sloop's program area (2.8M has been proposed by OART for Liquid Rockets) we called him to discuss how we should draft the letter to Mr. Dixon concerning the degree of control which Mr. Sloop plans to exercise over his program area. Mr. Chandler has for some time been working under very close control from his Headquarters Program Director, Dr. Burlage, who now works for Mr. Sloop. Dr. Burlage approves selection of contractors, reviews proposed scopes of work, and performs other functions which are generally considered to be functions of the Field Centers. However Dr. Burlage is apparently a very competent person and the relations between him and Mr. Chandler have been good, in spite of the rigid control. Mr. Chandler feels that we should not "rock the boat" as long as Dr. Burlage remains at the helm. The MSFC Liquid Propulsion Technology Program was well funded in FY-1962; the proposed letter to Mr. Dixon might be resented by Mr. Sloop and by Dr. Burlage and might affect the funding which they furnish MSFC in the future.

(1.1M for Solids?)

O.K.

B

Mr. Helles

(We just had to cancel a plan to experiment with plastic casings for solid rockets for this same reason)

What exactly have we planned in this area? Mr. Helles doesn't seem to favor NASD work in this area because of the general DoD/NASD agreement B&S

DATE: June 14, 1962

SUBJECT: Supposed letter to Dixon concerning Mr. Sloop's Program Operation

4. Based on the fact that Mr. Chandler can live with the situation, we do not propose a change. However, we are concerned that the tight control becomes a precedent and spills over to the other parts of OART.

5. Instead of sending a letter to Dixon criticizing Sloop's planned method of operation, perhaps it would be better to write a letter to Dr. Displingerhoff shortly after he has assumed direction of OART at the beginning of July. We could wish him luck, indicate our willingness to cooperate, etc. and in addition urge him to give the FIELD Centers reasonable freedom in conduct of advanced research and technology investigations and encourage the elimination of unnecessary paper pushing. We have just received another set of official guidelines from OART. (The first set was furnished to us on Feb. 1 and 2 when Mr. Dixon's group visited NSRG.) The new guidelines, which are quite lengthy, do not seem to stipulate any greater degree of control than the February guidelines, but the new guidelines indicate that a great deal of paper will be required. For example, proposed task area forms are to be submitted to OART on pink paper along with task forms, also on pink paper. After OART approves the task area forms, the Center will re-submit task area and task forms to OART on white paper, etc. NSRG is able to handle this increased paper work if it doesn't increase further.

Harvard Keller
Deputy Director
Research Projects Division

Enc: NOTES, 6-4-62 and 6-11-62

Where is it??

B 7/12

O.K.
Please
prepare
such a
letter
B

B 6/19

1. F-1 ENGINE PROGRAM: A joint MSFC/Rocketdyne/QMSF Meeting is scheduled for 6-27-62, to discuss slippage of PFRT, and the Magnitude of the associated overrun.

Reference paragraph 1, Notes Weidner 6-11-62 (Attachment A), Memo, M-P&VE-PL-272-62 (Attachment B) presents a summary of the various hydraulic gimbal systems now under consideration. ✓

* 2. J-2 ENGINE PROGRAM: The fire-damaged high-pressure LOX tank on VTS-1 has been removed for repair. Repair time is estimated at four weeks. Rocketdyne is moving a replacement tank from CTL-3 in order to minimize down time. ✓

Testing was resumed on VTS-3B with two Augmented Spark Igniters (ignition only) tests and two short transition tests on engine #2. ✓

LH₂ turbopump #4 was run with gas generator drive for a 326 second duration during this report period. Preliminary investigation revealed no hardware damage. ✓

* 3. M-1 ENGINE PROGRAM: Aerojet projects commitment of all funds (17.0 million) provided by the letter contracts during the first week of July. It is imperative that the additional 4.9 million FY-62 funds be made available on or before 7-1-62 to prevent a program work stoppage. ✓

4. RL-10 A-3: On 6-9-62, the RL-10 A-3 Engine completed the endurance portion of the Preliminary Flight Rate Test (PFRT) with no problems. ✓

* 5. H-1 ENGINE PROGRAM: All turbopumps on H-1 engines at MSFC have been examined for damaged or faulty bearings using the Rocketdyne test device. No bad bearings were found; however, a "clicking" noise was noted in the turbopump of Engine H-1053 (installed in position 7 of SA-4 booster). This engine will be removed for inspection. ✓

6. GENERAL: Planning for the throttling test series to be conducted at P&W has been expanded per QMSF agreement to approximately 30 tests over 3 or 4 months with NASA funding up to one million. ✓

Attachment A: Notes Weidner 6-11-62

Attachment B: Memorandum M-P&VE-PL-272-62, dated May 31, 1962, Subject: F-1 Engine Gimbal Hydraulic System

June 25, 1962.

1. COMPUTER FACILITY

We have completed a master plan for the Computer Facility at Slidell and a project request for the building modifications was submitted to Headquarters by Facility Engineering Office. ✓

Eberhard R.

← *Don't forget to look into this matter once more B*

2. CHRYSLER

The Chrysler Corporation Space Division was notified that the Packard-Bell 250 computer is to be employed in connection with the automatic check-out equipment at Michoud. ✓

3. GENERAL PLANT MODIFICATION

The stage contractors at Michoud were notified that the floor load test proved to the satisfaction of NASA personnel that new floor would not be required. Therefore, in the stage contractors areas the only floor breakout required would be for special foundations of tools and fixtures. ✓

4. MAJOR GENERAL McDONALD (RETIRED) VISITED MICHOD

Major General McDonald, (Retired), Consultant to the NASA Administrator visited the Michoud Operations on June 20, 1962. He was given a general orientation briefing and tours of the Michoud, Mississippi Test and Slidell facilities. ✓

5. CHRYSLER NEGOTIATIONS

Negotiations are being conducted with the Chrysler Space Division for the Saturn S-1 definitive contract. It is expected that negotiations will be completed by June 30, 1962. ✓

6. OFFICE BUILDING

Chrysler will present to MSFC this week the proposed plan for the commercial construction of the office building to be located in the vicinity of the Michoud facility. ✓

B6/28

1. Submittal of Notes to MSFC/CMHF: It is my understanding that effective next week, I am to submit weekly notes directly to Holmes on matters of concern to him in the LOC functional areas. I plan to furnish you a copy of these as an attachment to the weekly notes which I will continue to send to you concerning LVOD. Your comments or additional desire in connection with this plan would be appreciated.

*Red: That's fine with me
(I would like to be
kept informed on all
matters pertaining to facility
planning and scheduling)*
B

2. Consultant Visit to LOC: Retired (Army) Major General McDonald has been employed by Webb to look into the logistics problem at all NASA Centers. He visited me at the Cape on Monday, June 25, then DAVIS (AMR) on Tuesday. ✓

3. Additional Spaces: Approval has been received from NASA Headquarters for employment of an additional 114 personnel for LOC. This makes a total of 154 with the 40 spaces previously approved for LOC to become operational by the 1st of July. ✓

4. APOLLO-SATURN Launch Operations Panel Meeting: A panel meeting was held on June 20, 1962. Sub-panels were organized, missions were assigned to them, and methods of future operation were outlined. By the establishment of sub-panels, it is now possible for all operating level personnel in respective areas of responsibility to directly resolve technical problems on an expedited basis in groups of reasonable size. A significant agreement reached during the meeting was that the destruct system requirements for SA-5 through SA-10 would be prepared in the electrical sub-panel and would be submitted to the Range by LOD. ✓

5. Technical Evaluation of SA-3 for Reliability: Arrangements have been made with the MSFC Saturn Office to have ARINC make a technical evaluation of SA-3 at the Cape for reliability. The Scope of Work is being prepared by ARINC under guidelines furnished by the MSFC Saturn Office. ✓

6. Off Cape Administrative Facility: Documentation for lease of 15,000 sq ft gross area in the Cansaval Administrative Complex (new building in Cocoa Beach) is being prepared for submittal to NASA Headquarters. ✓

7. Camera Capsule System for Saturn was proven satisfactory by drop tests conducted at AMR. ✓

Ba/28

1. SATURN SA-2: The Saturn SA-2 Flight Evaluation Report has been distributed (June 15, 1962). ✓
2. CENTAUR F-1: The Centaur F-1 Flight Evaluation Report prepared by GD/A has been reviewed; comments concerning this report have been received from all MSFC evaluation groups and are being compiled by M-AERO-F. ✓

3. RECOVERY OF PORTIONS OF ATLAS 109 D: Several pieces of Atlas booster 109D have been recovered in the Union of South Africa. Atlas 109D is the vehicle which placed LtCol John Glenn into orbit. Three pieces of the booster were returned to the United States where two of these are being very carefully studied to determine meteoroid damage. The Union of South Africa required that one piece be returned to that country. In addition to the three pieces of skin, the helium storage bottle was recovered. ✓

The U.S. Air Force has given General Dynamics/Astronautics a contract to determine the number of meteoroid impacts, crater characteristics and number and size of penetrations. ✓

All three pieces of the vehicle skin were part of the conical nose section or in the transition region between the cone and cylindrical body. One piece is about 9 inches wide and 4 feet long. As of June 19, 1962, about 1500 craters had been counted on these three pieces. Four penetrations were noted. One hole was about 0.100 inches in diameter; the other three were between 0.040 and 0.060 inches in diameter. Both sides of the material were hit by meteoroids or other unknown objects. So far, no craters have been found on the helium bottle. Aeroballistics Division will receive copies of all reports concerning this. ✓

Atlas booster 109D made 5 1/3 orbits before re-entry. No scintillation measurements were made while booster 109D was in orbit. Therefore, nothing is known about the vehicle's orientation while in space or during re-entry. ✓

Five pieces of another vehicle have been found in Brazil. All five pieces were flown to Cape Canaveral and later to General Dynamics/Astronautics in San Diego, California. It has been definitely determined that two of the pieces are part of an Atlas booster; it is suspected that the other three pieces are part of an Atlas booster. All five pieces show signs of having been impacted with hypervelocity particles but the number of impacts or penetrations has not been determined. ✓

The pieces were reported to have fallen in Brazil in February 27, 1962. This does not coincide with a date of an Atlas flight. The exact recovery site and people involved in recovery are unknown. ✓

Col Branderburg, Scientific Attache' to Brazil, will be contacted for additional information. Of course, the studies being made at GD/A will be followed closely. ✓

✓
RDD } for
P&VE info
FPO
3

NOTES - GORMAN - 6/25/62

B 6/28

Negative report.

B 6/28

1. SA-4 ALIGNMENT TESTS: Alignment tests scheduled to be performed on the S-1-4 vehicle will not be completed prior to the static firing due to the interference and delay caused by turbine investigation reported last week. The vehicle was transferred to the Bldg. 4708 test cell for pressure testing on 6-22-62. ✓

* 2. SA-4 GEAR BOX NOISE: Investigation of the turbopump of engine H-1053 to determine the cause of high torque and noise disclosed damage to the #2 bearing. Further investigation on the bearing failure is continuing although preliminary analysis indicates ball bearing interference. No other defects were found and the turbopump was re-assembled and subsequently installed on the engine which has been installed on the vehicle. ✓

* 3. PRATT & WHITNEY QUALITY ASSURANCE PLAN: P&W's proposal covering the incorporation of NPC 200-2 ("Quality Program Provisions for Space System Contractors") in the RL-10 contract was received and evaluated. Several areas are considered unacceptable and a reply is being prepared to this effect. ✓

4. IBM GUIDANCE SIGNAL PROCESSOR: Personnel of this division visited NASA Headquarters, Office of Reliability and Quality Assurance, to discuss the changes, exceptions and interpretations of NASA Quality Publication 200-2 which were requested by IBM in connection with a proposed contract for the Saturn Guidance Signal Processor. Agreement was reached between our personnel and NASA Headquarters. Headquarters personnel are following this up with a meeting with appropriate IBM management personnel to assure increased emphasis on quality. ✓

B 6/28

1. MARINE ACTIVITIES:

NASA received title to 45 vessels (tugs, derricks, barges, etc.) on a non-reimbursable loan basis from the U.S. Army Transportation Corps, St. Louis, Missouri, 6/21/62. This equipment will be used by NASA and contractors for water transport of material during the construction of the test facilities in Mississippi, and after completion of construction, for servicing and fueling space vehicles on the test stands. Test Division is custodian of this equipment and arrangements for reactivation of a small part of the fleet is underway. ✓

K.H.
Please lay on a more detailed briefing for kees & myself
B

2. SA-T4: Successful 30-second safety firing made 6/19/62. Next firing due around 7/13/62, after incorporation of facsimile of S-1-5 60X control valve. ✓

3. S-IV COLD FLOW TEST PROGRAM AT DAC: Representatives of NSFC, under chairmanship of Test Division, are at Sacramento to witness cold flow testing with six engines. Purpose is to independently evaluate test operations and results and give go-ahead to DAC for hot firing battleship. ✓

4. RL10A NSFC TESTING: Engine, S/N 1713, arrived H-TEST this morning, less some valves. A requirement for more back-up hardware has been placed, otherwise this program cannot be sustained. Present shut-down just happily coincides with personnel being busy on Centaur & S-IV. ✓

5. H-1 LOX PUMP BEARING PROBLEM: Inspection of noisy #2 bearing from engine position #7, S-1-4 at Rocketdyne, revealed the cause of trouble to be contamination (shims, fiber, etc.). Fact that contamination was localized to this bearing seems to point once more to quality control. Reports are that bearing practically has to be taken apart to remove the contamination. ✓

6. MISSISSIPPI TEST FACILITY: Following recent decision reached on configuration of proposed test stands for S-1C at MTF, effort is being concentrated to finalize the MTF site plan on or before 7/12/62. The AE Contractor, Sverdrup and Parcel, has initiated the preparation of design criteria of the S-1C test stands and support facilities at MTF. Modification of the S&P contract to include additional studies, development of site plans, and preliminary design criteria of the S-11 stands is being processed by H-P&C short of award pending funding authorization which is anticipated 6/25/62.

K.H.
Request briefing on time plan
B

What's our time table for the first MTF - S11 stand?
Looks pretty urgent in view of propellant load limitations at Santa
Suzanna! B

NOTES 6/25/62 Helmburg

1. MARINE ACTIVITIES:

X
9CM NASA received title to 45 vessels (tugs, derricks, barges, etc.) on a non-reimbursable loan basis from the U.S. Army Transportation Corps, St. Louis, Missouri, 6/21/62. This equipment will be used by NASA and contractors for water transport of material during the construction of the test facilities in Mississippi, and after completion of construction, for servicing and fueling space vehicles on the test stands. Test Division is custodian of this equipment and arrangements for reactivation of a small part of the fleet is underway. ✓

X
9CM 2. SA-7s: Successful 30-second safety firing made 6/19/62. Next firing due around 7/13/62, after incorporation of facsimile of S-1-5 GOX control valve. ✓

X
9CM 3. S-IV COLD FLOW TEST PROGRAM AT DAC: Representatives of MSFC, under chairmanship of Test Division, are at Sacramento to witness cold flow testing with six engines. Purpose is to independently evaluate test operations and results and give go-ahead to DAC for hot firing battleship. ✓

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5. H-1 LOX PUMP BEARING PROBLEM: Inspection of noisy #2 bearing from engine position #7, S-1-4 at Rocketdyne, revealed the cause of trouble to be contamination (chips, fiber, etc.). Fact that contamination was localized to this bearing seems to point once more to quality control. Reports are that bearing practically has to be taken apart to remove the contamination. (Buy clean Bearings) at Rocketdyne! ✓

X
9CM 6. MISSISSIPPI TEST FACILITY: Following recent decision reached on configuration of proposed test stands for S-1C at MTF, effort is being concentrated to finalize the MTF site plan on or before 7/12/62. The AE Contractor, Sverdrup and Parcel, has initiated the preparation of design criteria of the S-1C test stands and support facilities at MTF. Modification of the S&P contract to include additional studies, development of site plans, and preliminary design criteria of the S-11 stands is being processed by H-P&C short of award pending funding authorization which is anticipated 6/25/62.

NOTES 6-25-62 HOELZER

B 6/28

- * 1. ADPS COMPUTERS: The decision has been made on replacing our 705 computer and the 1401 computer at the Cape - both machines will be replaced by IBM 1410's. The 705 will be replaced about November and the Cape 1401 will be replaced in August. ✓

2. FINANCIAL MANAGEMENT OFFICE COMPUTER: We now have a definite plan of action for putting the Financial Management Office operation on computers. We will transfer the 1401 from the Cape after their 1410 is working, and install the 1401 in Mr. Hardeman's shop for their use as a decentralized computer. Our General Electric contract will be increased by 25 people to man this computer and to do the keypunching for Financial Management. The larger M-FIN jobs will go on our 1410. It remains to be seen how well such an operation can be incorporated into an integrated data center concept later on, but with sufficient cooperation from both shops it can be done. Co-operation has been promised by both Hardeman and myself, of course. ✓

3. DECENTRALIZED COMPUTERS: The last of our four GE 225 computers has been installed in the HIC Building and it is up and running. This computer is manned solely by GE personnel. Our attempts to keep the other three 225's as solely government operated has led to undermanned installations considering the capability of these computers. We would prefer to keep these machines as a pure government operation, but this will require more Civil Service spaces in the forthcoming fiscal year. If such spaces are unavailable, we will have to use GE personnel on these other computers and thus have a mixed or "flesh peddling" type operation. These GE 225's have met with a happy reception on the part of the using divisions and they are already asking that we increase the capability of these machines by adding high density tapes and more core storage.

Note!

Personnel
from

Mac

Suggest you
look into
this matter
and take
planned
action

you consider
desirable

B

NOTES 6-25-62 HOELZER

- X
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→ Pers. Spaces will not be available. h.

B 6/28

1. CENTAUR:

a. F-2: The Centaur F-2 launch is currently scheduled for Feb 63. In view of the failure of F-1, GD/A somewhat belatedly is making a considerable pitch for eliminating the hot test of the Centaur stage prior to the flight in order to get the missile off as early as possible (Nov 62), thus gaining structural and dynamic data for missiles F-3 and on. Basically, of course, we would be against such an idea of flying a stage not hot tested, particularly prior to the first flight; however, in their justification they brought into light a lot of points which indicate that under the present circumstances the Centaur stage during hot test is exposed to certain excessive static and dynamic loads not present during flight. For that reason, a real problem exists and the matter is being discussed with P&VS and Test. ✓ *has been settled*

b. Guidance: Astrionics presented their recommendations to the Centaur guidance problem. In a nut shell, it is: the Minneapolis-Honeywell (M-H) guidance system is not adequate as to performance and reliability at the present time and does not show ways and means for improvement without a radical redesign. Therefore, it should be dropped and replaced by either the ST-124 (Saturn) or a modification thereof (ST-123), or a radio guidance system (Agena concept). Major problems arising: (1) Interim solution for carrying on Centaur flight program, (2) Termination of M-H contract and justification that about \$13 million should go down the drain without benefit, (3) Availability of the follow-on guidance in view of the operational program (with probably two additional R&D flights necessary), (4) Getting iron-clad material together to justify the kill of the M-H guidance (this is presently being done by Astrionics as the most urgent item before opening the Pandora box). In this connection, Dr. Haussersmann and I had a visit of the M-H St. Petersburg Manager, Jim Healy, to feel us out. I informed Healy about our present assessment of the Centaur situation and told him that one of the particularly bad points in this effort is that we have no firm proposals or suggestions from his company as to what should be done with his guidance system in the future. All that we know are a number of "quick fix" proposals for the immediate future. He brought a letter with him from the M-H President to you referring to your recent discussion with him in Huntsville. On account of our frank discussion here, he felt it necessary to take the letter back home and ask that it be revised. Apparently the tenor was a little bit cocky! ✓ *withdrawn to make notes*

c. Reprogramming: The reprogramming of the Centaur project was advanced by HQ sending a draft of guidelines (see attachment) which generally, were acceptable to us. A meeting will be held at Huntsville on Tuesday, June 26, with Dr. Morrison and Vincent Johnson where we will attempt to finalize our in the meantime 10-month old reprogramming efforts. ✓ *6/27*

2. AGENA:

Launch Operations: On Monday, June 25, Dr. Morrison, Dr. Debus, Dr. Gruene and myself will get together at the Cape to discuss once more the blockhouse situation during Agena launches, essentially whether the Air Force or Debus should run the show - an item which Don Heaton never solved. Also, the Gemini Agena launch situation will be discussed since Debus wrote us that for various reasons he will not have anything to do with it. This is not acceptable and will require further discussions also with the MSC people.

H.H.
Request joint
briefing by L&M and Astr.
B 6/28

Agree!

???

B

B 6/28

X 1. NOVA

The source evaluation board report on the NOVA study has been completed and will be forwarded to Mr. Holmes this week. It is hoped that a decision is made early in July and that contract negotiations can be completed by August 1, 1962. ✓

2. SOLID BOOSTED NOVA

We have reviewed with Boeing the progress during the first 1/3 of the present study. We have dropped all plans to have the study augmented by a design using 8 x 156" rocket motors. Instead, we are adding a task for a parametric study for payload capabilities in excess of 500,000 lb using 260" motors. Baseline design will have a 500,000 lb payload to a low earth-orbit. ✓

3. STATUS OF STUDY FUND OBLIGATIONS

It appears that we will be able to obligate all funds authorized for system and vehicle studies. A full breakdown will be given next week. ✓

4. COST PREVENTION PROGRAM

*Mr. Reus
gem*
MSFC has been fairly successful in obtaining and distributing funds. However, it would be very desirable to start an effort within MSFC with the objective to make the MSFC team members more cost conscious and develop a cost prevention program. Suggested action: Central Planning Office. *Please elaborate B*

5. COST ESTIMATING PROCEDURES AND INFORMATION PROCESSING FOR DECISION MAKING

I have been invited to give my thoughts on the above subject to Mr. Wyatt and his staff in an informal presentation on July 25. I would welcome an opportunity to discuss this subject with you and the Board. ✓

6. HYPERSONIC RESEARCH AIRPLANE

I have been invited by T. F. Dixon to attend a discussion on this subject on June 27 in Washington as the MSFC representative. This area is of interest to us in connection with recoverable boosters as one promising solution for the next generation of launch vehicles. ✓

Bd/28

* 1. SA-3: The SA-3 Booster was released to Quality Division on June 19 as scheduled, following the completion of post-static rework and assembly operations. ✓

2. Centaur: Ten key division personnel spent the past week at Convair to review tooling and fabrication processes. A full report will be furnished next week. ✓

3. Addition to Building #4707 for Vertical Structural Assembly: The design of this facility has been completed by the architectural engineer (Rust Engineering Company) on schedule and approved by MSFC. The final cost analysis by the AE, including the equipment for hydrostatic testing and cleaning, indicates total construction cost to be \$1,700,000, approximately \$560,000 higher than originally estimated. Since the original facility had been planned for the C-2 configuration, it has been known for some time that the approved funding was marginal, if not insufficient, for the additional requirements of increased crane capacity; bigger tanks, pumps and equipment for hydrostatic testing and cleaning; movable platforms; etc., imposed on us by the change from the C-2 to the C-5 configuration. The presently available money of \$1,140,000, however, is still sufficient to cover the cost of the basic building, including overhead cranes. The problem is then to fund the above named equipment which is a part of the building. We will, however, go ahead advertising the job with the unfunded equipment being called out in the advertisement as "Alternate Additions". ✓

Carson

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*① A LEGAL PROBLEM TOO!
② No action feasible prior
to FY 63 COF approval.*

1. C-1

SA-3: S-I stage was released to M-QUAL for post static checkout as scheduled on 6-19-62.

SA-4: S-I stage was delivered to pressure cell 6-22-62, two days behind schedule due to gearbox difficulty on engine S/N H-1053, however delivery for static test on 8-13-62 still looks good.

SA-5: S-I stage assembly is progressing satisfactorily. Delivery to pre-static checkout is scheduled for 11-1-62.

SA-D5: Start of assembly is forecast for 8-13-62.

CSD Contract: Formal negotiations, which started 6-21-62 are continuing satisfactorily.

2. C-5

S-IC: The balance of the Boeing Contract \$820,000 overrun (amounting to \$170,000) was funded during this week by release of FY-62 program authority from various S-IC procurement commitments which M-P&C could not obligate before 6-30-62.

M-SAT received GMSF's approval to proceed with the revised procurement and contract plan for the Boeing contract. The technical work scope was forwarded to M-P&C; meanwhile M-SAT is developing a technical work scope covering the total S-IC development plan. It is expected that this plan can be negotiated into a definitive follow-on contract well before the end of the interim period.

The definitive scope of work for Boeing participation in the C-5/S-IC Development Program is being reviewed prior to contractual negotiation.

S-II: Definitization of the plan is proceeding according to schedule. M-SAT will participate in government pre-negotiation at WOO during week of 7-2-62 where all analysis data will be discussed and formulated into a government position.

WOO advised on 6-15-62 that AF disapproved the NAA requested waiver for explosive hazards at Santa Susana. This means that maximum duration static test may be limited to 40-50 seconds for flight vehicle and 100 - 120 seconds for battleship. It is suggested that design of Santa Susana facilities continue through 7-15-62, however, allow no construction until some encouraging indication is given by AF & Rocketdyne that at least battleship testing will be approved, and to expedite MTF criteria for S-II that design can be initiated as soon as possible.

S-IV: Battleship testing is scheduled as follows: LOX cold flow on 6-27-62; LH₂ cold flow on 6-28-62; cold flow data evaluation during 6-29 thru 7-4-62; Hot firing to start 7-6-62.

Dynamic Vehicle Insulation scheduled to be completed about 7-6-62.
Systems Integration Area - Test completed on 6-22-62. Moving of equipment to Santa Monica checkout area will start week of 6-25-62.
Quality Assurance - Slots were obtained for AF to hire 3 people for SATURN Program on 7-1-62.

Union production workers contract expires 6-28-62; no work stoppage is anticipated.

3. APOLLO: As decided during Dr. von Braun's visit at Houston on 6-19-62, MSC and NSFC are setting up a meeting for 6-28-62 at Huntsville to finalize flight missions for C-1B.

Boyle

1. OMSF PROGRAM DOCUMENTATION - During a visit by Chris Andressen, Wiggins, Fraser, and John Goodrum to MSC we learned that MSC shares our apprehension regarding the implementation of the OMSF proposed directive on "Management and Program Documentation." The concern is that if the procedure is implemented to a detailed level, management authority can effectively be taken from the Field Centers and concentrated in Washington. We will discuss this matter with LOC and OMSF personnel this week and prepare a letter for your comment. ✓

H.M.

*which is not what
Edmund Holmes wants!*

2. DIRECTION FROM PROGRAM OFFICES NASA - It has become apparent that various NASA Program Offices are not coordinating their directions to Field Centers. For example, the directions concerning program execution issued by OMSF, OSS and OART are all quite different. We are investigating this situation with the objective of recommending to you a course of action. ✓

(Maybe some of his staffers do!)

3. LUNAR LOGISTICS VEHICLE CONCEPT - Mr. de Fries is exploring a Lunar Logistics Vehicle Concept using a 2-stage C-5 and an S-IV modified to give earth orbit departure, lunar braking and cargo capacity. The net payload is presently estimated at 20,000 pounds. The scheme will be ready for presentation to you upon your return from leave. ✓✓

4. MSFC PERSONNEL CEILING - We have learned that temporary appointments limited to 700 hours or less do not apply against the personnel ceiling. This represents a potential 100 vacancies within our ceiling. ✓

Take up with Vic S., please B

5. LUNAR LANDING MODE COMPARISON STUDY - Mr. Foster delivered the data prepared by Marshall for the "success" schedules, generated by OMSF, to Mr. Lilly's office on June 18, 1962, and remained to assist in consolidation of inputs from MSFC, MSC and LOC. Dr. Shea's office accepted (in essence) our critique and our realistic schedules for each vehicle for each mode. At the request of Mr. Little (Mr. Lilly's office) on June 21, we prepared rough cut estimates of cost for these schedules and furnished them to Mr. Little on June 22. We were assured that these estimates would be used for comparison purposes only and that MSFC would not be held to the estimates nor quoted. The summary is as follows:

	Cost in Billions (excluding institutional costs)			No. of Vehicles					
			Difference	6/15			6/22		
	6/15	6/22		C-1	C-1B	C-5/8	C-1	C-1B	C-5/8
LOR	3.90	5.02	1.12	16	12	10	15	13	18
EOR	4.89	6.30	1.41	16	24	19	15	20	33
DF	4.65	5.86	1.21	16	12	10	15	15	18

✓

Mr. Res
9000
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Mr. Res
9000
2. DIRECTION FROM PROGRAM OFFICES NASA - It has become apparent that various NASA Program Offices are not coordinating their directions to Field Centers. For example, the directions concerning program execution issued by OMSF, OSS and OART are all quite different. We are investigating this situation with the objective of recommending to you a course of action.

3. LUNAR LOGISTICS VEHICLE CONCEPT - Mr. de Fries is exploring a Lunar Logistics Vehicle Concept using a 2-stage C-5 and an S-IV modified to give earth orbit departure, lunar braking and cargo capacity. The net payload is presently estimated at 20,000 pounds. The scheme will be ready for presentation to you upon your return from leave.

Rees
4. MSFC PERSONNEL CEILING - We have learned that temporary appointments limited to 700 hours or less do not apply against the personnel ceiling. This represents a potential 100 vacancies within our ceiling. *(At this moment about 100 Temp. Emps.*

5. LUNAR LANDING MODE COMPARISON STUDY - Mr. Foster delivered the data prepared by Marshall for the "success" schedules, generated by OMSF, to Mr. Lilly's office on June 18, 1962, and remained to assist in consolidation of inputs from MSFC, MSC and LOC. Dr. Shea's office accepted (in essence) our critique and our realistic schedules for each vehicle for each mode. At the request of Mr. Little (Mr. Lilly's office) on June 21, we prepared rough cut estimates of cost for these schedules and furnished them to Mr. Little on June 22. We were assured that these estimates would be used for comparison purposes only and that MSFC would not be held to the estimates nor quoted. The summary is as follows:

are on our payroll - mainly ~~the~~ Clerk - Stereo etc)

	Cost in Billions (excluding institutional costs)			No. of Vehicles					
	6/15	6/22	Difference	6/15			6/22		
	6/15	6/22	Difference	C-1	C-1B	C-5/8	C-1	C-1B	C-5/8
LOR	3.90	5.02	1.12	16	12	10	15	13	18
EOR	4.89	6.30	1.41	16	24	19	15	20	33
DF	4.65	5.86	1.21	16	12	10	15	15	18

WHITE BRAIN 6-25-62

B 6/28

Mr. Russ
Please Note
from

Mr. Russ
Please Note
from

1. **PERT:** A PERT Task Group was established in July 1961 to implement NASA-PERT at MSFC, however, it has not yet become operational. It appears that due to lack of direction and firm policy, which has continually delayed operational implementation, PERT is consequently receiving undue criticism. I feel that the Board should immediately investigate this matter to come up with a conclusive disposition.

Eberhard

W.M.

2. **ENGINEERING SERVICES:** May Chrysler and Boeing work on entire vehicles rather than just their respective stages? We received a draft of a memo for your signature which says "no"; however, Mr. Russ and H-SAT tell us "yes". We need them to work on the entire vehicle.

No objections on any path.

(CC - C) Boeing-GS

3. **PERT:** Mr. W. E. Davidson has been assigned to the PERT Resident Project Office, Sunnyvale, California.

The Lockheed total facilities requirements for manufacturing PERT at Moffett Naval Air Station, California, are expected within a few days. As an alternate plan, in the event political pressure prevents further construction or program activity in the Sunnyvale area, Lockheed is prepared to submit a facilities plan based on the blimp hanger at Brunswick, Georgia.

Check with

M-SPT re work statement

though. While both companies should be eligible

for overall vehicle work is too early to make an official overall vehicle systems contractors

B

4. **MOVING PERSONNEL:** Onboard as of 6-21-62: 315.

* 5. **S-II:** In a two-day meeting between five members of the S&ID Materials Staff responsible for the S-II stage and the Engineering Materials Staff at which the major materials problems associated with the stage were discussed, two areas were particularly noteworthy as to need for immediate and concentrated attention: (1) S&ID needs much help in development and evaluation of materials for the heat shield and flexible curtains. (2) The amount of land (approximately 1500 ft. to property boundary) available at Santa Susana is too small to reasonably expect the Armed Services Explosive Safety Board to approve this site for full-duration, all-systems test firing. Consequently, it will be recommended that the blast hazard program recommended by S&ID be dropped.

6. **GENERAL:** The following people were named for membership to the NASA Steering Committee for Space Vehicle Criteria of which E. Hellebrand is a member: R. Hunt, F&VE, Structures Subcommittee; J. Stenott, F&VE, Structures Subcommittee; J. Farrow, F&VE, Environmental Subcommittee; H. Vaughn, AERO, Environmental Subcommittee; J. Scroggins, AERO, Environmental Subcommittee; J. Socha, ASER, Environmental Subcommittee; C. Wood, F&VE, Propulsion Subcommittee; J. Thomson, F&VE, Propulsion Subcommittee; F. Bigsby, ASER, Stability and GSC Subcommittee; W. Miner, ASER, Stability and GSC Subcommittee.

7. **UNMAN CARGO STAGE:** A preliminary layout and weight study of the Unmanned Lunar Cargo Landing Stage "Project Alpha" was completed and the results were released to Future Projects Office.

Green

*Mr. Lee
Please note
join*

*SA-5
AND
FOLLOWING*

*Mr. Lee
Please note
join*

1. PERT: A PERT Task Group was established in July 1961 to implement NASA-PERT at MSFC, however, it has not yet become operational. It appears that due to lack of direction and firm policy, which has continually delayed operational implementation, PERT is consequently receiving undue criticism. I feel that the Board should immediately investigate this matter to come up with a conclusive disposition.

2. ENGINEERING SERVICES: May Chrysler and Boeing work on entire vehicles rather than just their respective stages? We received a draft of a memo for your signature which says "no"; however, Dr. Raes and M-SAT tell us "yes". We need them to work on the entire vehicle.

3. RIFT: Mr. W. E. Davidson has been assigned to the RIFT Resident Project Office, Sunnyvale, California.

The Lockheed total facilities requirements for manufacturing RIFT at Moffett Naval Air Station, California, are expected within a few days. As an alternate plan, in the event political pressure prevents further construction or program activity in the Sunnyvale area, Lockheed is prepared to submit a facilities plan based on the blimp hanger at Brunswick, Georgia.

4. BOEING PERSONNEL: Onboard as of 6-21-62: 315.

5. S-II: In a two-day meeting between five members of the S&ID Materials Staff responsible for the S-II stage and the Engineering Materials Staff at which the major materials problems associated with the stage were discussed, two areas were particularly noteworthy as to need for immediate and concentrated attention: (1) S&ID needs much help in development and evaluation of materials for the heat shield and flexible curtains. (2) The amount of land (approximately 1500 ft. to property boundary) available at Santa Susana is too small to reasonably expect the Armed Services Explosive Safety Board to approve this site for full-duration, all-systems test firing. Consequently, it will be recommended that the blast hazard program recommended by S&ID be dropped.

6. GENERAL: The following people were named for membership to the NASA Steering Committee for Space Vehicle Criteria of which E. Hellebrand is a member: R. Hunt, P&VE, Structures Subcommittee; J. Sterett, P&VE, Structures Subcommittee; J. Farrow, P&VE, Environmental Subcommittee; W. Vaughn, AERO, Environmental Subcommittee; J. Scroggins, AERO, Environmental Subcommittee; J. Boehm, ASTR, Environmental Subcommittee; C. Wood, P&VE, Propulsion Subcommittee; J. Thomson, P&VE, Propulsion Subcommittee; Y. Digesu, ASTR, Stability and G&C Subcommittee; W. Miner, ASTR, Stability and G&C Subcommittee.

7. LUNAR CARGO STAGE: A preliminary layout and weight study of the Unmanned Lunar Cargo Landing Stage "Project Alpha" was completed and the results were released to Future Projects Office.

NOTES 6-25-62 Rudolph

B 6/28

Negative

1. SUPPORTING RESEARCH: Revised FY-1963 OART guidelines, including preliminary funding information, were received by MSFC on June 11. The following table compares the total funding requested by MSFC to the actual funding which can be expected from OART, according to the guidelines:

<u>Technology Program Area</u>	<u>Requested</u>	<u>OART Guidelines</u>
Biotechnology	700K	350K
Space Power(1)	400K	500K
Space Vehicle Systems(2)	16,244K	8,738K
Electronic Systems	8,360K	4,890K
Nuclear Rockets (Advanced Technology Only)	2,600K(3)	1,000K
Chemical Propulsion Research	8,500K(4)	3,900K
	3,455K	1,450K

- (1) Apparently some of the investigations proposed by MSFC under Electronics Systems were transferred by OART to Space Power; therefore the OART guidelines show more than actually requested.
- (2) Includes Mr. Koelle's "Advanced Concepts" requirements (6,000K requested, 2,650K guidelines).
- (3) Funds requested by PAVE (RIFT Technology) and also by RPD (LVT).
- (4) Funds requested by PAVE (Liquid Propulsion Technology and Solid Propulsion Technology), and by RPD (LVT).

2. RESEARCH INSTITUTE: A presentation to Mr. Webb on June 21 to obtain backing for the University of Alabama Research Institute apparently convinced him that our desires to support it are worthwhile. However, he is faced with the problem of finding funding in a manner to avoid criticism to NASA. Mr. Webb requested that Drs. McCall and Shelton of MSFC and Dr. Pow of the University of Alabama meet this week in Headquarters to attempt to find a more palatable plan for funding the institute.

3. SPACE SCIENCE SUMMER STUDY: Last week I attended the opening sessions of the Space Science Summer Study at the State University of Iowa. The program is under the cognizance of the National Academy of Sciences and is planned for the scientific community to evaluate the U. S. space program. Some significant events were:

(a) During the first two days, leading scientists such as Dr. Van Allen, Dr. Whipple, etc., gave status reports on their specific fields.

(b) NASA briefings were given by the Directors of NASA Offices or their representatives, eg. Newell (OSS), Steller (OA), Shea (GWSF), Cassow (OART). Dr. Newell presented new schedules of spacecraft flights. First mission flights with CENTAUR in 1964, no SATURN shown. Dr. Shea discussed the various modes to the moon, and said a decision is pending. Dr. Shea's requirements to the summer study group are to define objectives of the manned lunar landing and to acquire early scientific and engineering data about the moon. Dr. Shea mentioned plans for a logistic supply operation using C-1B and C-5 vehicles.

Beko

1. J-2 ENGINE: Six engine system tests to evaluate the effect of a two-position main LK valve on hydrogen pump stall during transition were conducted on VJ2-3. Starting characteristics were not materially improved. Engine system testing with the two-position main LK valve will continue utilizing various valve timing and sequencing.

A high augmented-spark-igniter mixture ratio on the last engine test resulted in burnout of the engine injector which necessitated injector replacement on engine J-001. This is the second time an engine injector has been burned out in this manner. The augmented spark-igniter check valves are being modified to prevent a recurrence. Replacement of the injector took approximately 1 1/2 days. ✓

X
Jen
2. F-1 ENGINE: A \$1.0M letter contract has been sent to Rocketdyne for the purpose of procuring the long-lead hardware to support the F-1 engine follow-on R&D program. Also, \$1.0M was forwarded to the Air Force for the approval of the facility appendix associated with the manufacturing tools and equipment necessary for the production program.

Engine system test activity at Edwards Air Force Base has been stopped up significantly during the past month. A test of engine 003 (with 5U injector) was terminated by rough combustion cutoff during start transition. The low frequency clugging was attributed to mixture ratio shift due to a sequencing change in main fuel valve design.

A joint NASA-NASA Headquarters decision was made to have separate R&D and deliverable engine cost-plus-fixed-fee contracts.

Further discussion will be held between NASA-NASA and Rocketdyne to establish the extent of R&D slippage. ✓

X
Jen
3. H-1 ENGINE: Aerojet will have committed the entire \$17.0 million allocated under the current H-1 letter contract by the first week in July. This means that it is urgent that NASA receive the additional \$4.9 million to be allocated under the FY-62 supplemental budget prior to 7-1-62 to assure continued funding of the H-1 program. ✓